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October, 1935

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★ Pages 19-23

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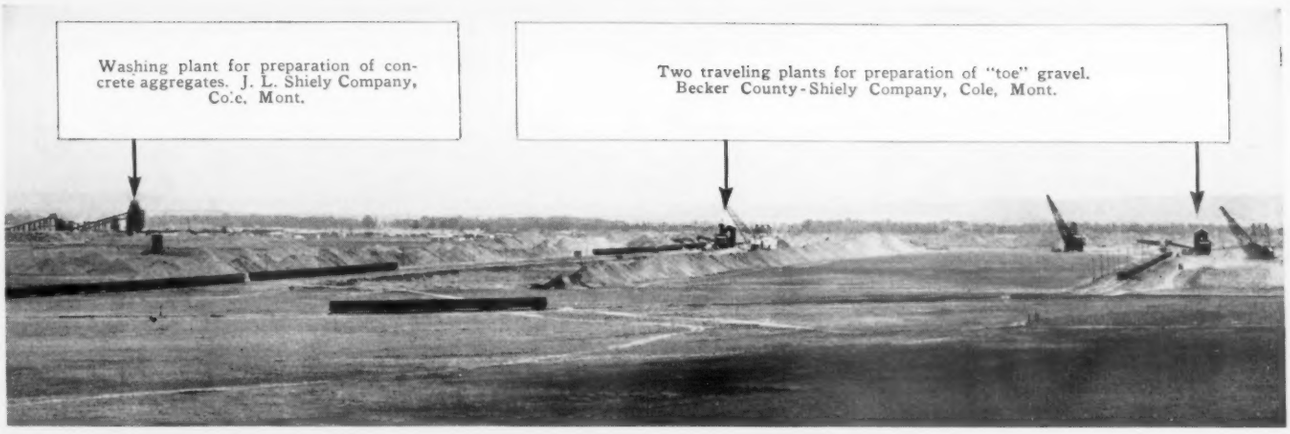
Washing plant for preparation of concrete aggregates. J. L. Shiely Company, Co.e, Mont.
Two traveling plants for preparation of "toe" gravel. Becker County-Shiely Company, Cole, Mont.

3 LINK-BELT PLANTS Producing Material for Fort Peck Dam

One of the two Link-Belt traveling plants owned by Becker County-Shiely Company, Cole, Montana. These plants produce, and load into cars "toe" gravel for the Fort Peck Dam. The sand is screened out and returned to pit, the oversize being delivered to trucks for disposal.

TWO of these plants are of the traveling type mounted on car wheels and operating on wide gauge tracks. They are owned by the Becker County-Shiely Company, and operate at Cole, Montana, producing "toe" gravel for the toe or bottom of the slope of this earth-filled dam. The stationary plant also located at Cole, is owned by J. L. Shiely Company and produces washed and screened sand and gravel for concrete tunnel lining, retaining walls, spill-ways, etc. Send for book No. 1240.

LINK-BELT COMPANY 5401

The Leading Manufacturer of
Equipment for Handling Materials and Transmitting Power
PHILADELPHIA . CHICAGO . INDIANAPOLIS . ATLANTA
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Stationary plant owned by J. L. Shiely Company at Cole, Montana, which produces sand and gravel for Fort Peck Dam.

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Pit and Quarry

With which is consolidated
CEMENT-MILL & QUARRY

Volume 28 OCTOBER, 1935 Number 4

MEMBER AUDIT BUREAU OF CIRCULATIONS

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals. Entered as second-class matter November 28, 1932, at the Postoffice at Chicago, Ill., under the Act of March 3, 1897.

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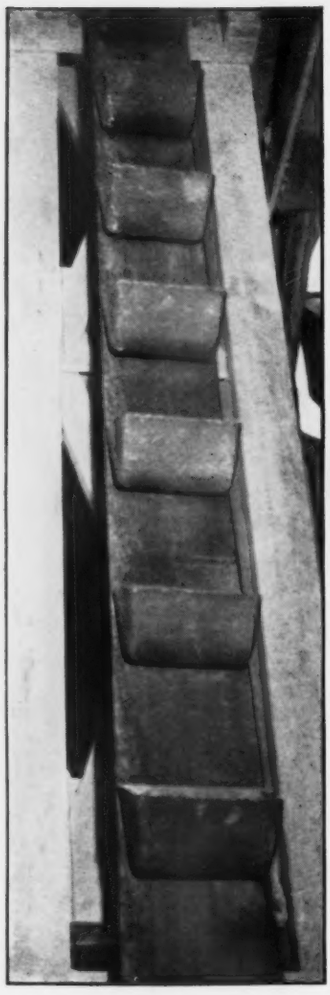

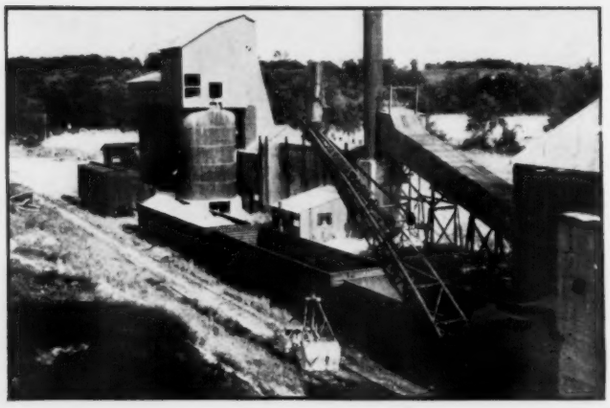

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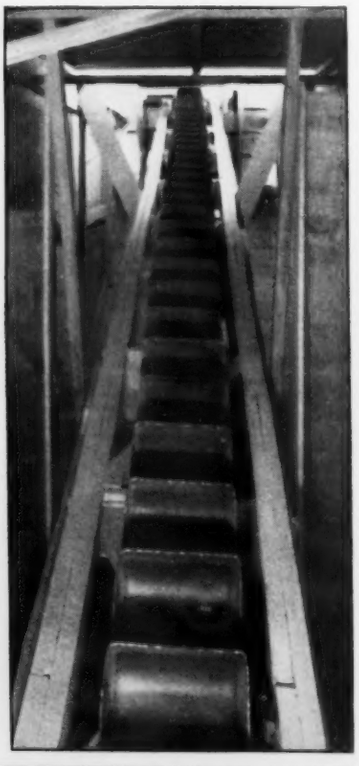
GIVE EXCEPTIONAL SERVICE IN SILICA PLANTS

★ At this silica sand plant, Republic Conveyor and Elevator Belts were installed long ago for the handling of all material from the crushers to the shipping cars. The outstanding service which these belts have given is typical of their dependable performance under hundreds of similar difficult conditions. Examples of this service are the elevator and accessory belts, now over five years old, which convey the material from the rotary drying kilns. Unusually high temperature of the material would soon deteriorate the cover and fabric body of any but the most scientific belt construction. Recent, close inspection has failed to locate any sign of weakness in these belts after their long, hard usage and today they are pronounced "practically as good as new."

Republic Conveyor and Elevator Belts are made in many types of constructions to meet the severe conditions encountered throughout all branches of stone quarry and sand pit operations.



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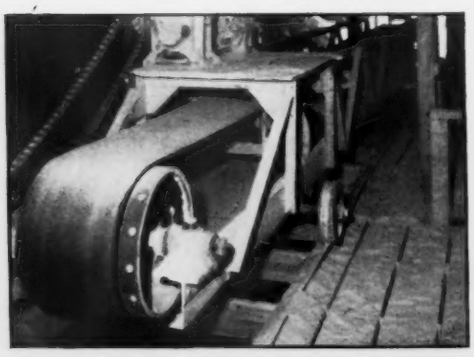

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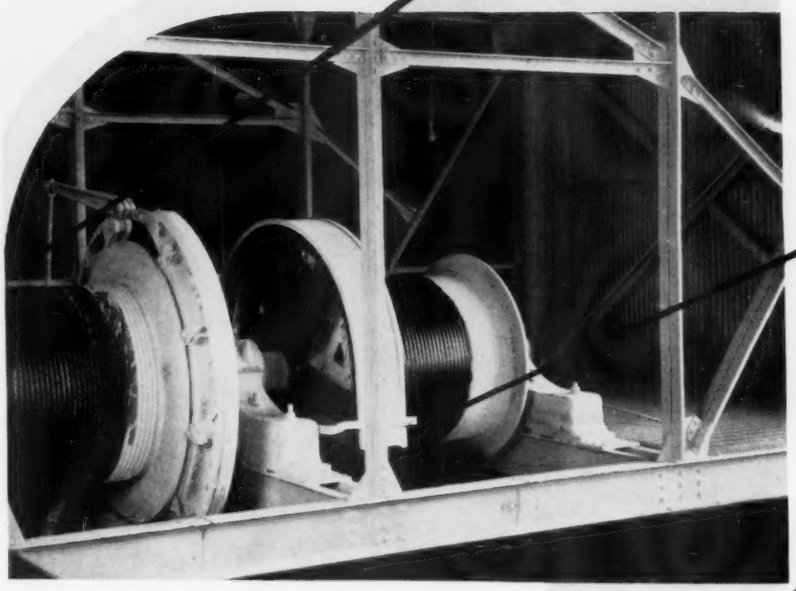

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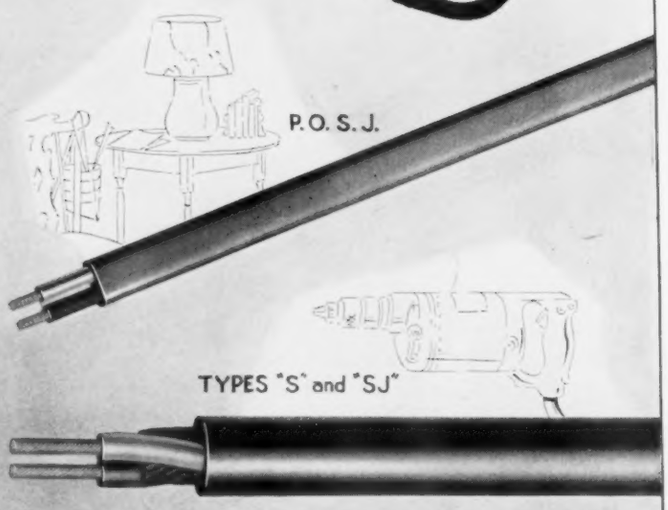

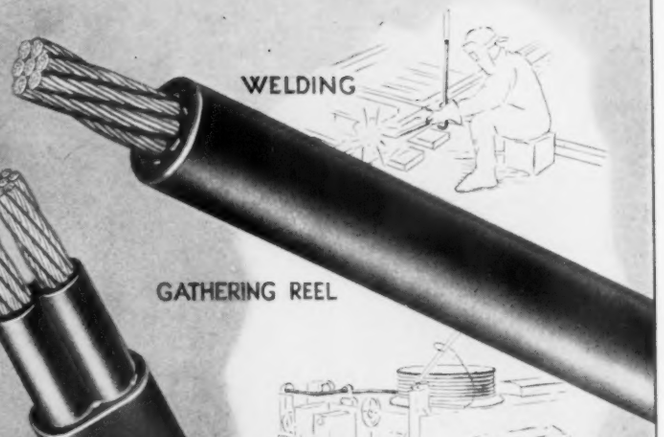

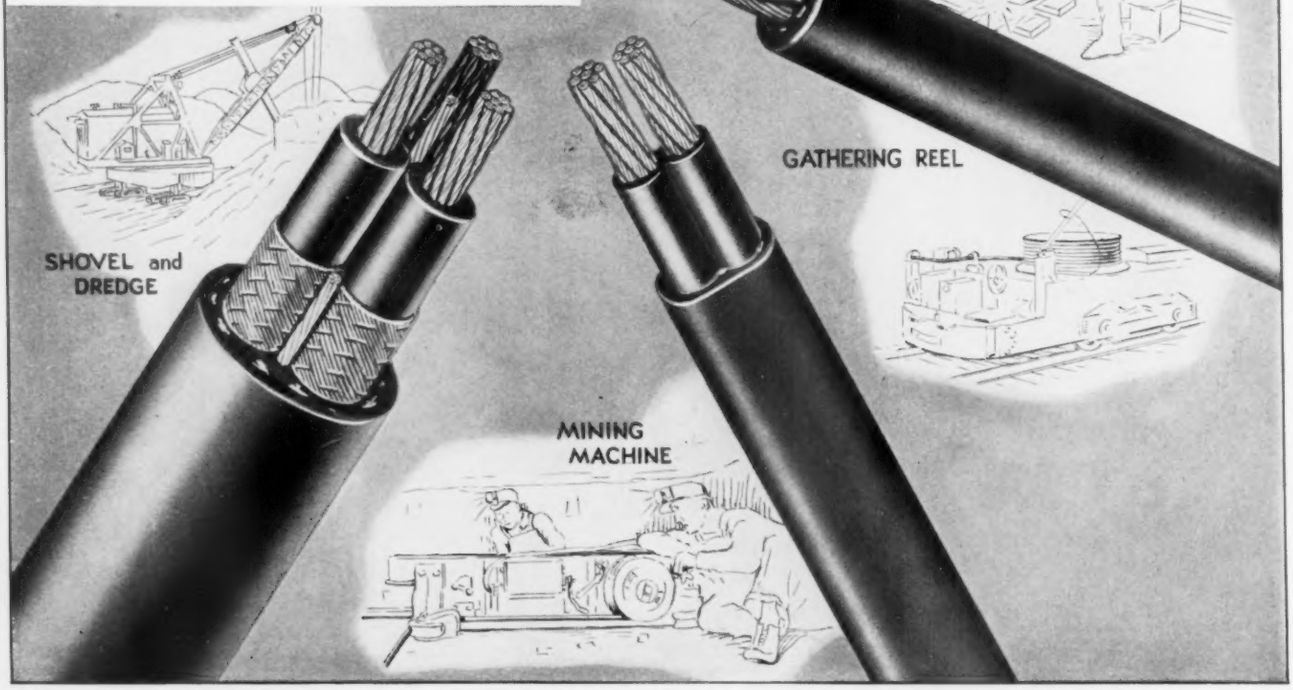

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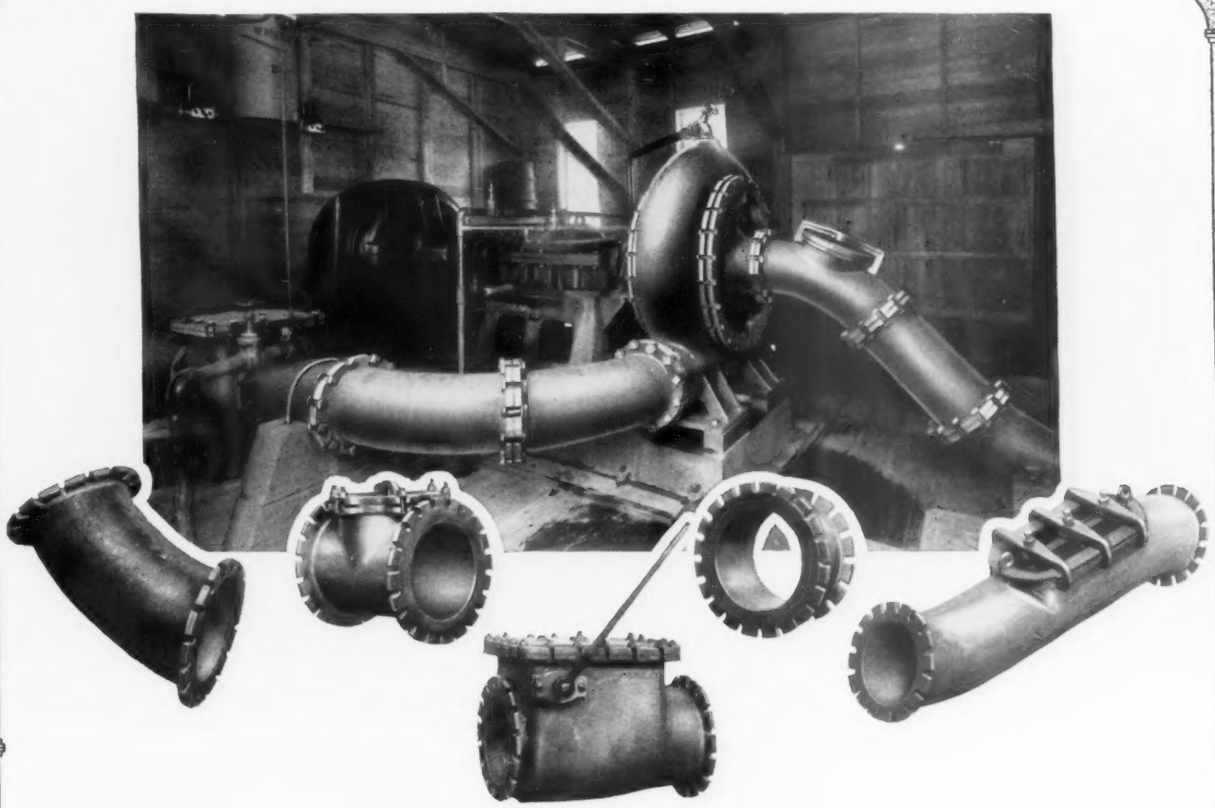

HYDRAULIC DREDGE PIPE LINE FITTINGS

AMSCO Dredge Pipe Line Fittings fully meet the needs of the Hydraulic Dredging Industry for strong and long-service fittings in pump and pipe line hook-ups. They have been used successfully for years under the most severe pipe line velocity and pressure conditions. Their use contributes to the highest overall efficiency of hydraulic dredges at minimum cost of repair parts and repair labor, and assures the greatest number of productive operating hours. They embody: Safety, Dependability, and Economy.

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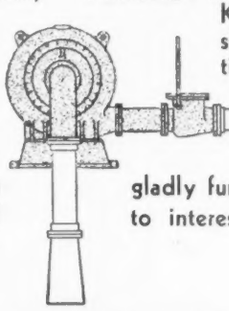

We invite your inquiry for application details on AMSCO Dredge Pipe Line Fittings. We will gladly furnish descriptive information and prices to interested parties. Write for details today!

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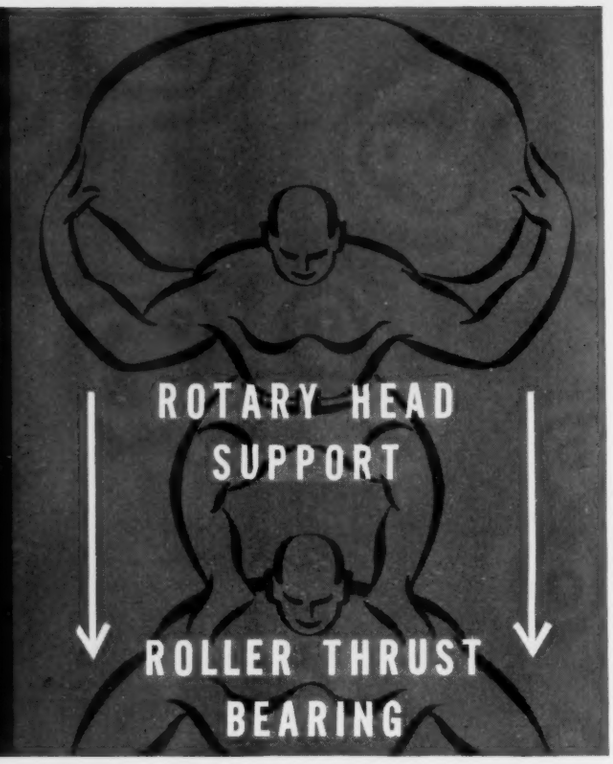
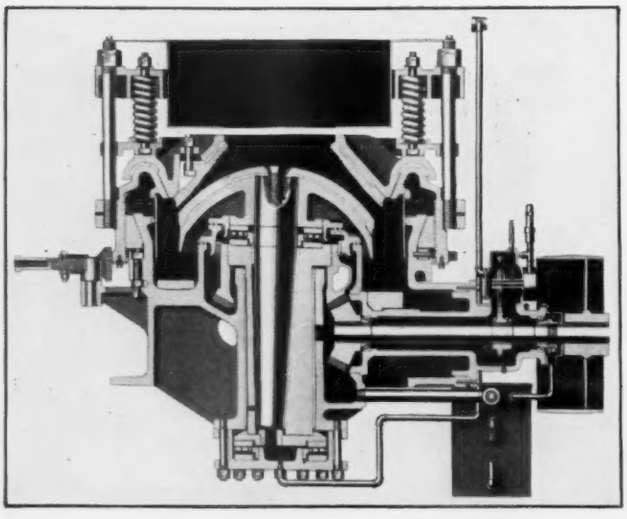


How? Radial pressures are reduced; and vertical pressures are increased. The spherical shape of the crushing head greatly reduces the lateral pressures—relieving the load on the bronze eccentric sleeves. Diverted downward—the heavy load is concentrated on the rotary head support and roller thrust bearings which are strategically designed to take it best.



This explains the low power consumption, longer life, lower upkeep and greater tonnage of the Telsmith Gyrasphere Crusher.

Write today for Bulletin Y-15.

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April 29, 1935
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Lima, Ohio
Attention: Mr. Henry Barnhart
Gentlemen:
We wish to take this opportunity to express our sincere appreciation of the many favors extended us in connection with our negotiations, and the keen interest you have shown in our operations in connection with the building of the Spillway.
We are exceedingly pleased with the performance records of the 701 LIMA shovels purchased for this work. These machines have more than fulfilled our every expectation. We will be pleased indeed to recommend the LIMA to any prospective purchaser.
Yours very truly,
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By H. J. Massman
President
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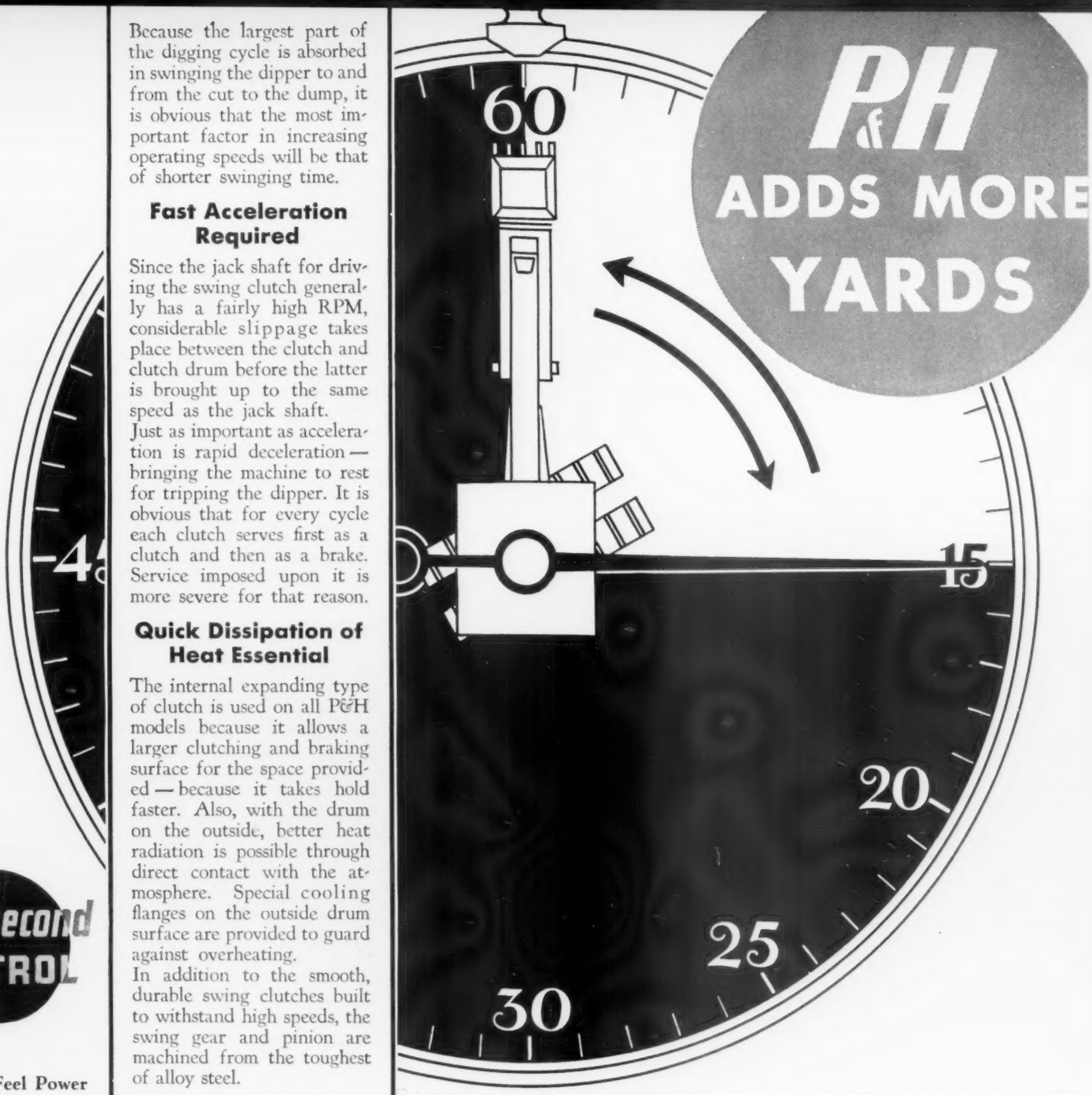

P&H ADDS MORE YARDS

split second CONTROL

1. Sure Feel Power Clutches
2. Self Starter
3. Power Dipper Trip
4. Super Smooth Swing Clutches
5. Rapid Reversing Crowd Planetaries
6. Full Vision Cabs

Because the largest part of the digging cycle is absorbed in swinging the dipper to and from the cut to the dump, it is obvious that the most important factor in increasing operating speeds will be that of shorter swinging time.

Fast Acceleration Required

Since the jack shaft for driving the swing clutch generally has a fairly high RPM, considerable slippage takes place between the clutch and clutch drum before the latter is brought up to the same speed as the jack shaft.

Just as important as acceleration is rapid deceleration — bringing the machine to rest for tripping the dipper. It is obvious that for every cycle each clutch serves first as a clutch and then as a brake. Service imposed upon it is more severe for that reason.

Quick Dissipation of Heat Essential

The internal expanding type of clutch is used on all P&H models because it allows a larger clutching and braking surface for the space provided — because it takes hold faster. Also, with the drum on the outside, better heat radiation is possible through direct contact with the atmosphere. Special cooling flanges on the outside drum surface are provided to guard against overheating.

In addition to the smooth, durable swing clutches built to withstand high speeds, the swing gear and pinion are machined from the toughest of alloy steel.

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P&H machines use the external type of swing gear with the swing pinion mounted at the rear. When the machine tips forward under heavy load, the swing pinion tends to move away from the combined swing gear and roller path to avoid strain and damage. It has the additional advantage of *forcing out dirt* and other obstructions instead of collecting them to ultimately clog the gears.

BY *SPLITTING* SECONDS *on the Swing*

Watch one of these P&H's hit its stride and you'll see why we talk about this super smooth swing clutch—why it obsoletes all other types.

It's the faster get-away and the quicker stopping that cut down swinging time and make possible more passes per hour. Remember that swinging time absorbs up to 67% of the digging cycle.

This quick-acting clutch is built for punishment. It's an internal expanding type . . . air cooled with a grooved periphery drum surface. The simplest kind of adjustment keeps it at top notch efficiency. It's a Split Second feature that really piles up extra yardage.

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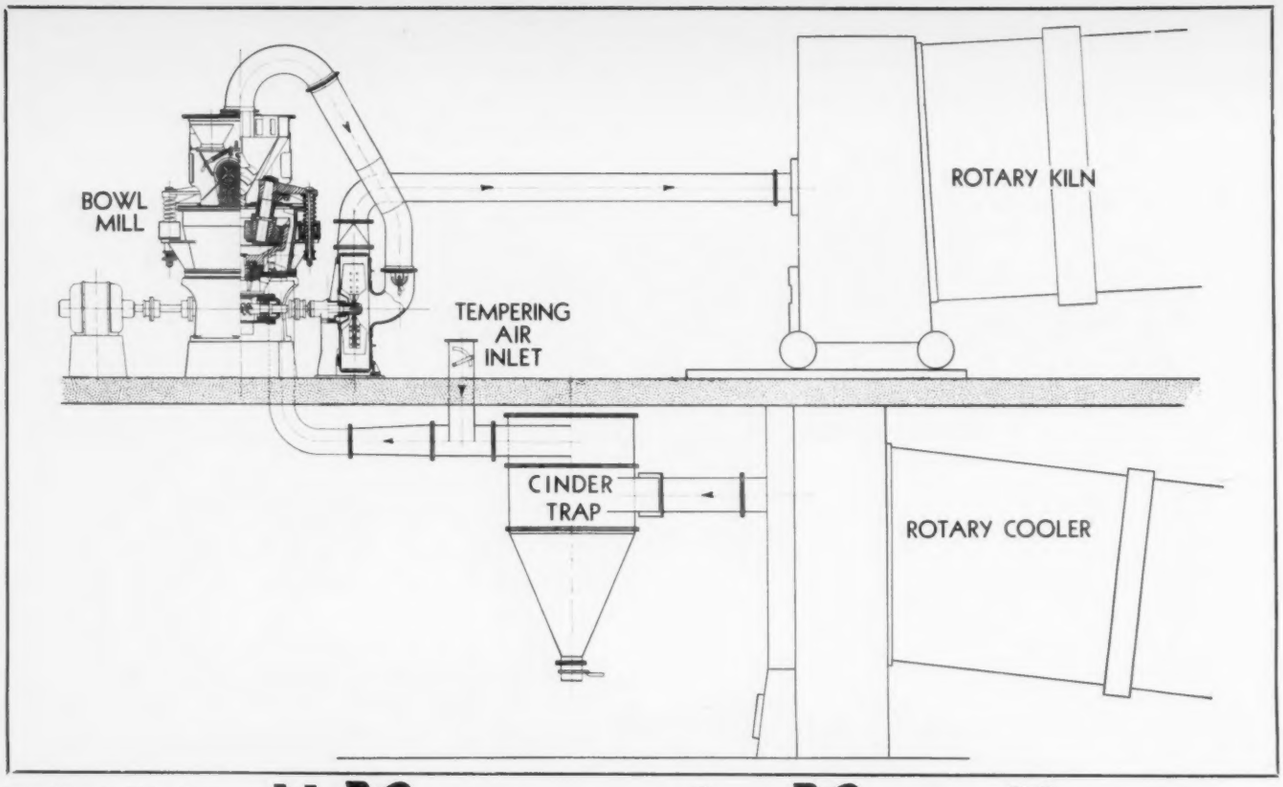

Flow Sheet of Bowl Mill, direct-firing rotary kiln

"Raising the Ratio" with Bowl Mill firing

RAYMOND BOWL MILL

For grinding coal and miscellaneous non-metallic minerals and manufactured products.

SEARCH the records of the coal grinding field, and we doubt if you will find any machine that has *made good* so fast as the Raymond BOWL MILL.

Comparatively a newcomer, the BOWL MILL is beating the old-timers in output per kilowatt, on upkeep economy, and for income per dollar of investment.

This report on a recent installation is typical of the performance of the BOWL MILL: In direct-firing a rotary lime kiln, the BOWL MILL replaced producer gas—and increased the lime-to-coal ratio from less than 2:1, up to more than 3:1—results that speak for themselves.

The BOWL MILL was designed and built for its job from the ground up. It has everything that modern engineering skill, and 48 years' experience, could put into it to insure continuous operation without shutdowns—quiet running—easy control—unfailing lubrication.

RAYMOND BROS. IMPACT PULVERIZER CO., Division of Combustion Engineering Co., Inc., 1321 North Branch Street, Chicago. Sales Offices in all Principal Cities. Canadian Representative: Combustion Engineering Corporation, Ltd., Montreal.

The new BOWL MILL Bulletin gives complete details—copy on request

RAYMOND

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the safer blasting agent

is available in four grades

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Nitramon has these advantages

Based on nine months of field experience, here are some of the advantages of Nitramon over any blasting agent previously used in well-drill blasting operations:

1. **Safety**—Nitramon can be detonated only with a high explosive cartridge.
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3. **Economy**—Performances have shown that savings of 7% to 20% are possible when Nitramon is properly used.
4. **Adaptability**—Nitramon is manufactured of four grades to meet all well-drill blasting requirements.

Every Nitramon container is identified by the DU PONT "oval"—the mark standing for progress, integrity and dependence in the development and manufacture of explosives.

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NITRAMON

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THE IMPROVED BLASTING AGENT

Let's Look at Cordeau -- for Wagon Drill Holes

Factors that dictate the use of wagon-mounted drills often indicate the use of Cordeau. Deep vertical holes of medium size are easier to load, and unquestionably "go" with added force, when Cordeau is used as the detonating agent. Where the rock formation necessitates "deck" loads, Cordeau offers a big saving. The line of Cordeau, extending from the top to the bottom of the hole insures simultaneous detonation of each load . . . Cordeau pays in *at least* five ways. Why not write for the Cordeau Book? THE ENSIGN-BICKFORD CO., *Simsbury, Connecticut.*

CORDEAU PAYS IN 5 WAYS

1. Simplified loading
2. Less Hazard
3. More work from your explosives
4. Better fragmentation
5. Fewer but bigger shots (Equipment moved less often)

Write for the Cordeau Book.

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BICKFORD
ALSO SAFETY FUSE *Since* 1836

CB-47

THE ENSIGN-BICKFORD COMPANY

Tomorrow's Wire Rope
...what will it be?

TO MAKE CERTAIN that Roebling Wire Rope will give the user the highest obtainable degree of safe, economical service, Roebling has enlisted the aid of the finest and most complete research, testing and manufacturing facilities. The Roebling fatigue testing machine shown is an example. John A. Roebling's Sons Company, Trenton, N.J. Branches in Principal Cities.

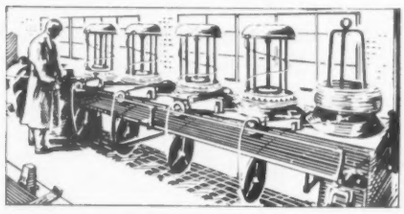
"Some people tell me the world is completed. But I say that behind the scenes, in research laboratories now humming with activity, the world is just in the making."

(From address of a famous industrial executive)

And so in the Roebling Laboratory, one of the country's most modern and completely equipped industrial research units, goes on the ceaseless work of improving Roebling Wire Rope... of developing the wire rope of the future.

The 40,000 lbs. capacity "dynamic" fatigue testing machine shown to the left is one of the relatively unknown and costly pieces of equipment in this laboratory. The mechanism at the extreme left of the picture is an automatic regulator and recorder... the only machine of its kind in existence for making fatigue tests of long sections of wire rope.

A WIRE DRAWING MILL ...IN A LABORATORY!



An experimental wire mill... right in the Roebling Laboratory. A duplicate, on a small scale, of Roebling's main wire drawing plant. The continuous 5-head wire drawing machine shown is part of the equipment in this experimental wire mill.

ONE OF AMERICA'S FINEST INDUSTRIAL RESEARCH UNITS

An exterior view of the 3-story building devoted entirely to Roebling Research.

ROEBLING ...THE PACEMAKER IN WIRE ROPE DEVELOPMENT

The Koehring Wheel Dumptor
for hauling · dumping · spreading

Proven Performance

—in quarry operation for stripping work. 4 of a fleet of 7 Koehring Dumptors hauling and dumping the over-burden at costs lower than any previous method. Front dump, eliminating time-consuming backing and turning, greatly increases production. Repeat orders for this type of work are proof of the efficient and economical performance of Koehring Dumptors.

The automatic kick-out pan insures a clean and speedy dump for any type of material. The load is instantaneously dumped by force of gravity, without mechanical complications.

KOEHRING COMPANY

Pavers · Mixers · Shovels · Cranes · Draglines · Dumptors · Mud-Jacks

3026 WEST CONCORDIA AVENUE, MILWAUKEE, WISCONSIN

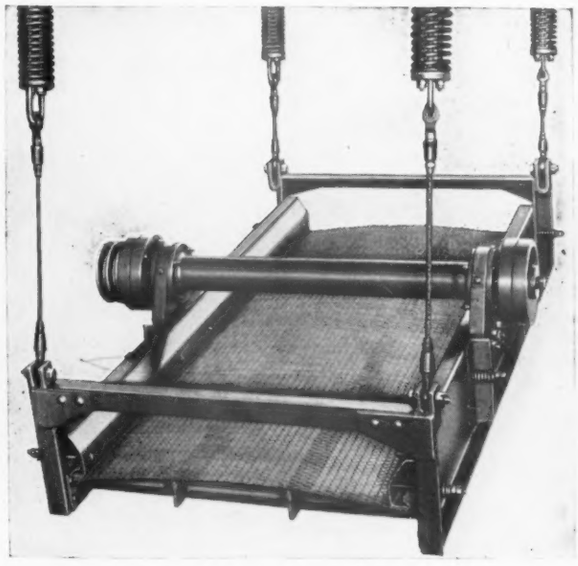
Two Types of Screens

.... *which do you need in your plant?*

ALLIS-CHALMERS vibrating screens are available in two types . . . in sizes suitable for every plant. They are used for sizing crushed stone, slag, ore, sand and gravel, coal and coke, wood chips, commercial fertilizer, in fact, nearly all kinds of materials sized for commercial purposes, either wet or dry.

Aero-Vibe Screens

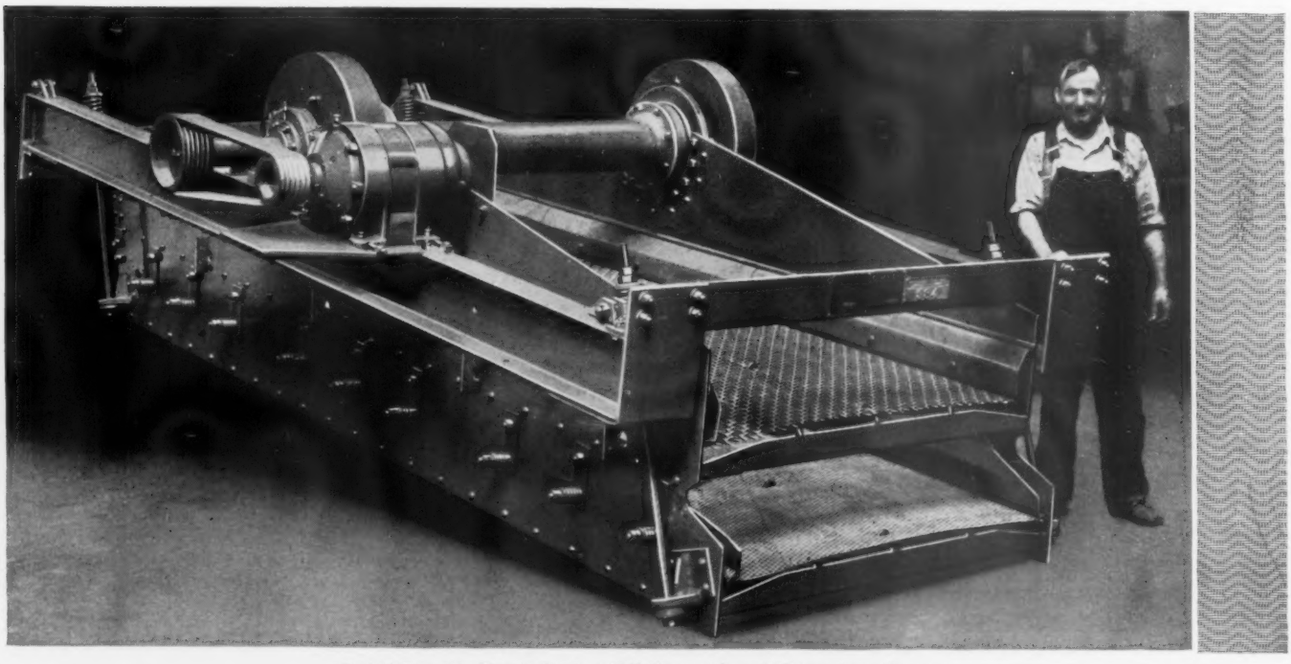
The "Aero-Vibe" screen "floats in the air" suspended from the supporting structure by cables and springs. A rapid, adjustable, vibrating motion is produced by counterweighted wheels mounted on the drive shaft supported in anti-friction bearings above the screen body or vibrating member. Single and double deck "Aero-Vibe" screens are available from 1½ x 3 ft. to 4 x 10 ft. sizes for handling medium to fine size materials, and for limited tonnage.



3'x6' Single Deck Aero-Vibe Screen

Centrifugal Vibrating Screens

Style "B" Centrifugal screens are built with one, two, or three decks in sizes from 2 x 6 ft. to 5 x 14 ft. and are adaptable for heavy loads and the maximum range of material size. The screening action, which is equally intense for all tonnages, is transmitted to the screen body or vibrating member by an eccentric shaft located above the screen and supported in anti-friction bearings. The screen body "floats" on balance springs reducing power and the load on the bearings; the entire screen is cable and spring suspended.



5'x14' Double Deck Style "B" Centrifugal Vibrating Screen

ALLIS-CHALMERS

— Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, U.S.A. —

STURTEVANT

***THIS** air separator*
separates to any fineness from 30 mesh to the micron sizes

***THIS** air separator*
increases mill capacities 25 to 40% and delivers an uncannily perfect product

Follow the "LEADER": you will find it predominating in all industries

because of its dependable products—Its larger capacities—The low power cost per ton of material handled—Its freeness from repair costs.

Ask us what this separator will do for you. How it will increase your pulverizer capacities.

To answer these questions we will want to know: Material to be separated. Fineness of wanted product. Percentage of this fineness in the feed to separator. Tonnage wanted in finished product. Kind and size of pulverizer to be used with separator.

STURTEVANT MILL CO. HARRISON SQUARE BOSTON, MASS.

VOLUME 28 NUMBER 4

Pit and Quarry

With which is consolidated

CEMENT-MILL & QUARRY

CHICAGO, OCTOBER, 1935

Louisville to Greet Annual Safety Meet

DISCUSS DUST AND ACCIDENTS

The 24th Annual Safety Congress of the National Safety Council will be held in Louisville, Ky., October 14 to 18. The meetings will be held in three hotels—the Kentucky, the Brown and the Seelbach. As in the past, separate programs have been arranged for various industries such as cement, quarrying, mining, etc. There will be an exposition at which will be shown safety devices of all kinds. Chief among the speakers already announced are John E. Long, president of the Council, Wm. S. Knudsen, vice-president of the General Motors Corp., Governor Harold E. Hoffman of New Jersey, and Dr. Miller McClintock of Harvard University.

The following programs have been announced for the Quarry Section:

OCTOBER 16, ROOM 512, KENTUCKY HOTEL.

Address by E. J. Mehren, president, Portland Cement Assn.

The Cause and Prevention of Injuries from Machinery in Operation, by W. M. Cabannas, assistant superintendent, Signal Mountain Portland Cement Co., Chattanooga, Tenn.

A Review of the Best Safety Educational Features Used by Ten Cement Plants, by R. H. MacFetridge, superintendent, Lehigh Portland Cement Co., Birmingham, Ala.

OCTOBER 17, ROOM 512, KENTUCKY HOTEL.

Annual report of General Chairman Wm. H. Baker.

Dust Hazards in the Quarry Industry, by J. Wm. Fehnel, Chemist, Industrial Hygiene Laboratory, Metropolitan Life Insurance Co., New York.

Election of officers.

Address (subject to be announced), by H. F. Yotter, insurance supervisor and safety engineer, General Crushed Stone Co., Easton, Pa.

Sues for $25,250 for Cement-Dust Damage

Charging that ever since the Wabash Portland Cement Co. plant opened at Osborn, in 1926, it has been discharging large quantities of smoke and cement dust, which settle on his farm adjoining the cement plant, Howard L. Batdorf has filed suit in the Common Pleas Court demanding $25,250 damages from the company.

The farmer complains that the cement dust accumulates on his crops and fruit trees, gets into his eyes, nose and throat, settles on the furniture and bed clothes and even on his food.

Batdorf bases the extent of his damage on claims that the dust has lowered the market value of his farm from $18,000 to $5,000; that he loses 25 per cent. of his corn crops; that his fruit trees have been ruined; and that the cattle refuse to eat the dust-coated pasture.

Aggregates Conventions To Be Held in St. Louis

The Mineral Aggregates Institute has announced that the next annual conventions of the National Crushed Stone Assn., the National Sand & Gravel Assn., and the National Slag Assn. will be held concurrently during the week of Jan. 27, 1936, at the Hotel Jefferson, St. Louis, Mo.

Although the program has not been announced, it is known that one day will be devoted to a general program arranged by the Institute. Each association will, of course, have its separate program as in the past.

Public Service Body Says Marble Not Rock

Marble is not rock, according to a decision rendered August 22 by the Utah Public Service Commission in a rate dispute which a quarry had with a railroad.

The Intermountain Marble Co. of Salt Lake City asked the Commission to order the Denver & Rio Grande Western Railroad Co. to refund a portion of the freight charges paid on two shipments of marble from Birdseye Spur to Salt Lake City. The company contended that the railroad had violated a utility rate regulation which provides that carriers may not charge a different rate for the same commodity. After consulting, it was stated, all available authorities on the subject of rock and marble, the commission decided that rock and marble are different materials and denied the request of the complaining firm.

Clinker-Cooling System Bought by Cumberland

★ The Cumberland Portland Cement Co., has recently completed the installation of a Lee traveling-grate clinker-cooling system at its plant at Cowan, Tenn., at an approximate cost of $25,000.

Suits Filed to Disbar St. Louis Attorneys

MALPRACTICE, FRAUD CHARGED

Charging that they have been guilty of "professional misconduct, malpractice, fraud, deceit and misdemeanor in their professional capacity as attorneys at law," suits were filed in St. Louis on Sept. 11 to disbar Otis M. Gallant and Marion J. Hannigan, St. Louis attorneys and partners in the practice of law. The petition of the State Bar Disciplinary Committee lists 56 suits in which either the Missouri Portland Cement Co. or the Universal Atlas Cement Co. was defendant. Efforts to obtain statements from Gallant and Hannigan were unsuccessful.

It was stated that the two lawyers had had contracts with more than 300 former employees of the Hannibal, Mo. plant of Universal Atlas, the first of which were signed in the early spring of 1934, and the list included former cement-plant workers, not only living at Hannibal and Ilasco, but in nearly a dozen surrounding towns and cities.

In the hearings held by the Bar Committee a large number of witnesses was examined.

National Gypsum Gets Control of Universal

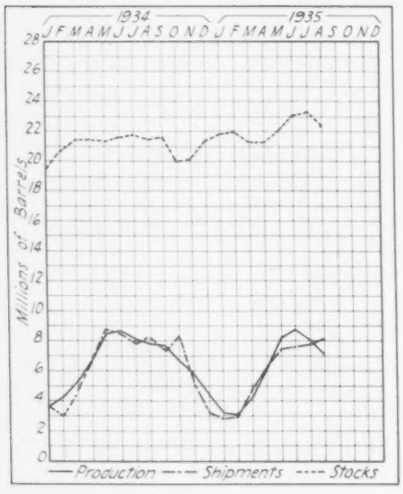
Acquisition of control of the Universal Gypsum & Lime Co., Chicago, Ill., by the National Gypsum Co., Buffalo, N. Y., by an exchange of stock, has become effective. Universal for the present will be operated as a subsidiary, and plans are being made for the consolidation of the sales and manufacturing direction of the two concerns. Melvin H. Baker, president of National Gypsum, has been elected president of Universal and chairman of its board. Others elected to the Universal Gypsum board are W. M. Currie, C. E. Thomson, W. G. Houck and W. H. Baker. Additional members of the new directorate are J. L. Baker, L. E. Armstrong and H. K. Urion.

★ The Inland Lime & Stone Co., Manistique, Mich., has installed Stephens-Adamson spring-steel belt wipers on all of the belt conveyors in its plant.

Cement Output in August Below 1934

STOCKS 4.6 PER CENT. HIGHER

The Portland-cement industry in August, 1935, produced 7,235,000 bbl., shipped 8,105,000 bbl. from the mills, and had in stock at the end of the month 22,418,000 bbl. of cement. The production of Portland cement in August, 1935, showed a decrease of 7.7 per cent. and shipments a decrease of 1.7 per cent., as compared with August, 1934. Portland-cement stocks at the mills were 4.6 per cent. higher than a year ago. The statistics here given are compiled



Cement production, shipments and stocks to August, 1935.

from reports for August, received by the Bureau of Mines, from all manufacturing plants except one.

In August cement production was only 31.8 per cent. of the capacity of 162 plants reporting, as compared with 34.5 per cent. for 163 plants for the same month of last year. For the 12 months ended with August, 1935, the ratio was 27.4 per cent., compared with 26.8 per cent. for the previous year. The production-capacity ratio in July, 1935, was 35.3 per cent., in June, 39.6 per cent., and in May, 36.1 per cent.

Universal at Duluth Wins Sixth PCA Trophy

Dedication of a safety trophy for a year's operation without an accident was held at the Universal Atlas Cement Co., Duluth, Minn., 750 employees and their families attending. This trophy first was awarded the Duluth plant in 1925 and the 1934 award is the sixth time the plant has won the honor, the other years being 1927, 1929, 1932 and 1933.

P. N. Bushnell, safety engineer for the Portland Cement Assn. at Chicago, presented the trophy, which was accepted for the company by O. B. Potter. The speakers included: Supt. R. S. Huey, Asst. Supt. Fred Robinson, Paul C. Van Zandt, Chicago, vice-president in charge of operations; A. G. Carlson, Chicago, chief engineer; E. D. Barry, Chicago, assistant operating manager; Gordon C. Huth, Chicago manager of the bureau of safety and casualty. A. S. Hetherington, safety director, was master of ceremonies.

Waterloo Producers Open New Stone Plant

★ McKenzie & Holm, Inc., Waterloo, Ia., have recently opened a quarry, installing a 15-in. by 36-in. Universal crusher for primary and a 12-in. by 30-in. triple-acting Bakstad crusher for secondary crushing. They use a rotary screen for a scalping and are running 24-in. and 18-in. belt-conveyors to a 60-ft. tower where they have a double-deck vibrating screen. From there they load by gravity into cars or bins. They also have a 1½-cu.yd. crane for stock-piling and in the quarry a 1½-cu.yd. shovel and 3-cu.yd. hydraulic dump trucks. For drilling operations they are using a 240-cu.ft. air-compressor with jackhammers.

Cement Company Union Includes 561 Employees

The newly organized company union of Marquette Cement Mfg. Co. employees was presented with its charter as an affiliated local of the United Cement Workers' Union by William Schoenberg of the American Federation of Labor, on Sept. 4. The following officers were elected: John McGraw, president; Robert Pioli, vice-president; Felix Butkus, recording secretary; Ed Wolfe, financial secretary; William Corless, treasurer.

Five hundred sixty-one employees, taking in the entire working force of the Marquette company, are said to be listed in the membership rolls of the new union.

Mr. Schoenberg stated that the Marquette Cement Mfg. Co. is held in the highest regard by the A. F. of L. because of the fair treatment it has always accorded its employees.

Tractor, Shovel Save Labor for Cement Firm

★ The Louisville Cement Co. of Speed, Ind., recently improved its plant facilities by the installation of a Model GI-30 Trackson-Deering crawler tractor and Trackson High-Shovel for digging and transporting solid rock to grade. The machine does the work of 30 men in one-tenth of the time required by man-power. The draw-bar feature of the shovel eliminates the work of 36 men.

★ The plant of the Marquette Cement Mfg. Co., located at Cape Girardeau, Mo., has installed a Multiclone dust collector which will soon be in operation.

Grand Coulee Cement Contracts Awarded

4,220,000 BARRELS COST $8,000,000

Costing more than $8,000,000 for delivery at the Grand Coulee dam site, a 4,220,000-bbl. cement order has been awarded three Seattle firms and two Spokane cement companies. This is the largest cement order in history, and Spokane firms estimated it would require a freight train 110 mi. long to carry the entire shipment.

The Olympic, Superior and Northwestern Portland Cement companies of Seattle and the Spokane and Lehigh Portland Cement companies of Spokane will share the order.

Low figures of $1.37 a bbl., f.o.b. mill, were submitted by the Northwestern and Superior companies of Seattle and the Lehigh company of Spokane. Other bids were $1.38, $1.53 and $1.40. Government estimates ranged from $1.75 to $2.50 a bbl., f.o.b. the mill. James E. O'Sullivan, secretary of the Columbia Basin Commission, estimates freight costs from Spokane or Seattle cement plants to the government rail-head at Odair will be about 60c a bbl., making cost of delivery at the dam site $1.97 per bbl.

Cement for Coulee Dam will be unloaded at a rate of 5,076,000 lb. each day, with a total of 1,586,720,000 lb. to be used. Approximately 950 men will be employed for two years for production alone. About 17,000 carloads of cement will be shipped, giving work to extra train crews and to men employed in mining gypsum, lime rock, shale, coal and iron. A special cement, known technically as "modified Portland," will be used on the project. This requires the admixture of from 10 to 15 lb. of iron ore for each 376-lb. bbl.

Manufacture will start as soon as inspectors from the U. S. Bureau of Standards complete the cement tests.

St. Louis Alpha Plant Turns to Powdered Coal

The Alpha Portland Cement Co., at its Alpha, Mo., plant (near St. Louis), resumed operation on August 2, at 50 per cent. capacity, using pulverized coal for fuel. Officials of the company say that a standing order for 3 carloads of coal per day has been placed; at the present rate of mill operation this will amount to 55,000 tons annually. The plant, which formerly used natural gas, had been closed for several weeks, due to the installation of coal-burning equipment. The efforts of the Southern Illinois Reciprocal Trade Assn., in inducing this plant to return to the use of coal, will increase the consumer buying power by $119,000 a year, and at full capacity operation of the mill this amount will be doubled.

Construction Sets New High for 1935

AUGUST FIGURE IS $168,557,200

Construction in August reached a new high level for 1935. The contract total exceeded the totals reported for each month since October, 1931, with the exception of December, 1933, January and March of 1934. Records made public by the F. W. Dodge Corp. indicate an August contract total for all types of construction in the 37 eastern states amounting to $168,557,200. During July the volume reported totaled $159,257,500, while in August, 1934, only $119,591,800 in contracts were reported.

August construction records showed residential-building contracts of $40,528,300, nonresidential-building awards of $58,488,500, and contracts for heavy engineering projects in the amount of $69,540,400. For residential building the total was about 16 per cent. smaller than was reported for July, but a gain in excess of 100 per cent. was registered, when compared with the total of only $18,634,000 for August, 1934. For the first eight months of 1935 residential contracts awarded in the 37 eastern states totaled $297,096,700, as compared with only $170,226,500 for the corresponding period of last year.

Nonresidential-building contracts as well as awards for heavy engineering projects during August exceeded the levels reported for either the previous month or August, 1934.

Revamping of Spokane Plant Nearly Finished

It is reported from Spokane that improvements to the Irvin, Wash., plant of the Spokane Portland Cement Company, estimated to cost more than a quarter of a million dollars and including a huge Lepol kiln, the only one of its kind on the western hemisphere, are practically completed.

More than five car-loads of machinery from the Polysius Corp., Dessau, Germany, have been installed under the direction of Engineer Otto Voigtlaender and Supt. Karl Fahland, both of Germany. With the new loading equipment a box-car can be loaded in 45 min., whereas this would take several hours if loaded by hand and the plant output is increased from about 6 to 11 car-loads per day.

Kentucky Rock Asphalt Reorganization Ended

Reorganized under a plan approved by bondholders, creditors and stockholders, the Kentucky Rock Asphalt Co. of Louisville, Ky., on Sept. 14 began a new phase of its corporate existence. President D. D. Thompson said that the new plan should enable the company to operate at considerably reduced fixed charges, allowing the firm to re-establish itself as a dominant factor in the road-building business.

The reorganization alters the capital structure as follows: The defaulted interest on $613,000 first-mortgage bonds is entirely abated and the coupon rate reduced from 6½ to 4 per cent. The holdings of $1,304,600 of 7-per cent. preferred stock and 126,819 shares of common stock are cut in halves. Support of local and state governmental authorities in Kentucky will be sought for the company's product so that it can obtain consideration in other states, Mr. Thompson stated.

Stone Producer Buys Mixers and a Batcher

★ The Maule-Ojus Rock Co., of Miami, Fla., with plant and wharfage at 1730 Purdy Ave., Miami Beach, has installed a new bin and batcher. It has also purchased six Blaw-Knox truck mixers mounted on special Ford V-8 chassis. The new bin is a 2-compartment, 100-ton unit and the 1½ cu. yd. batcher is of the latest type. The plant has a capacity of 250 cu. yd. daily, according to Chas. J. O'Brien, civil engineer and special representative of the Blaw-Knox Co., Pittsburgh, Pa., who is supervising the erection of the bin and batcher and will continue in charge of the plant.

Cement Plant Shut by Diversion of Gas Tax

Supt. J. W. Campbell of the North American Cement Corp. at Howes Cave, N. Y., reported that it was necessary to close down the plant Sept. 15, due to the state having voted that only a small part of the gasoline tax be used for roads, and to delay on the the part of the State Highway Dept., which is only now taking bids for work under the Federal grants. The work will not require cement until some time in 1936.

The company recently celebrated its record of having had no lost-time accidents for the first six months of 1935, and of more than 1,237 successive days without a lost-time accident.

Dust Filter Added to Olympic's Equipment

★ The Olympic Portland Cement Co. of Bellingham, Wash., recently purchased from the W. W. Sly Manufacturing Co. a Sly dust filter of the flat-bag type, with exhaust fan, fan drive and dust piping, to take care of four 4-tube Bates packers in its stockhouse. This filter will be so installed that a screw conveyor under the dust hoppers will return the collected cement to the bins over the packers.

★ C. E. Duff, sand-and-gravel contractor of Belle Center, O., has bought a ⅝-cu.yd. Champion excavator.

FHA Activities Top All Former Records

ONE WEEK'S BUSINESS $14,420,375

The largest activity for any week since the beginning of the program was recorded at the Federal Housing Administration the week ending September 21. Banks and other financial institutions reported $14,420,375 worth of business under both the Modernization Credit and Mutual Mortgage Insurance Plans.

There were 20,971 modernization loans totaling $7,455,878; which bring the total made since the beginning of the program in August, 1934, to 422,777, valued at $159,285,674. The 1,858 mortgages selected for appraisal totaled $6,964,497, bringing the total since the start of the program last December to 44,155 for $172,200,694.

The total volume of modernization and repair work stimulated by the program far surpasses the loans made. It is estimated that property owners have spent since August 1, 1934, a total of $853,703,838. The estimated amount for the week ending September 21 is $29,652,449.

The large volume of business done under the two plans of the Federal Housing Administration are reflected in building permits. Figures from the Bureau of Labor Statistics show that permits for new residential construction reported by 772 cities in different parts of the country amounted to 207 per cent. more in August, 1935, than in August, 1934. Permits for additions, alterations and repairs reported by the same cities were 54 per cent. greater.

Cement, Sand, Gravel Prices Fall in Gotham

An average decline since March of 5 per cent. in prices of basic masons' building materials in 19 leading metropolitan districts of New York state is estimated by Myron L. Matthews in the current Dow Service Daily Building Reports. The figures are based on prices of six materials—Portland cement, plaster, sand and gravel, common brick, and face brick. Cement and sand and gravel have shown a tendency to fluctuate, but for several months the average change in these three materials has been downward. Not infrequently they have been selling in New York city at prices slightly lower than listed prices of $2.25 for cement, $2 for sand and $2.90 for gravel.

Evansville Gets Its First Truck Mixers

★ The Hy-Rock Products Co., Evansville, Ind., established late in June, has three transit mixer trucks. This is the first time such trucks have been used in Evansville. Edgar Traylor is president of the company.

State Loses $625,000 in Cement-Plant Sale

$25,000 LOSS ON CEMENT BAGS

Official records have revealed that, in dismantling the Chelsea, Mich., cement plant at a loss of $625,000 to taxpayers, the state government sold equipment at a fraction of its true value, in some cases without calling for bids, and giving away more than 300,000 empty cement bags worth at least $25,000.

A 40-ton $15,000 crane was sold for $1,500 without determining whether a better price could be obtained, and powerful electric motors at 50 per cent. of their junk value.

It was stated by the State Administration Board that, through an error, E. Lenick & Co. of Saginaw, bid on 410,000 bags and got 706,317, a gift of approximately $25,000.

The Chelsea plant was purchased in 1924 by the administrative board for $500,000, minus legislative authority to buy it. In 1931 a lobby financed by private cement companies, applied pressure in legislative chambers, and a law was passed, compelling the state to close the plant by 1934. In compliance with this statute it was advertised for sale last year.

The cement plant, for which $665,127 was paid by the taxpayers, will have been disposed of for about $40,000 when the transaction is completed, and the huge investment will be represented by 800 acres of land.

Receipts from the dismantling process totaled $37,400 to Sept. 15.

Miners Ask That More Rock Asphalt Be Used

Nearly 200 unemployed miners appeared at the capitol at Oklahoma City on August 27 to request that more asphalt be used in road construction, so that the Southern Rock Asphalt Co. in Murray County, where they have been employed, can resume operation. The workers stated that they wished to remind the governor of his campaign promise that Oklahoma asphalt would be used in the construction of Oklahoma roads. Commissioner Ferris, to whom the men presented their cause, explained that stringent Federal regulations had delayed the Oklahoma highway program, which in turn has delayed the demand for road materials.

Stabilized-Gravel Roads Disclose High Density

Thoroughly-compacted stabilized gravel roads attain a density equal to that of Portland-cement concretes, according to investigations by Fred Burggraf, materials engineer of the Calcium Chloride Assn.

These remarkable densities are exhibited by soil roads constructed by the stabilization method developed as a new type low-cost surface through soil studies of the U. S. Bureau of Public Roads.

In test samples, weights of 145 to 154 lbs. per cu.ft. were shown by stabilized gravel taken from roads which had been in service a year or more. This is approximately the same as the weight of Portland-cement concrete, which averages about 150 lb. per cu-ft. Gravel, clay and calcium chloride, mixed according to standard specifications, were used in the construction of the roads tested.

Crane and Batcher Bins Added to Ohio Quarry

★ The plant of the Blue Rock Quarry of Fayette County, O., according to H. B. Biehn, president of the corporation and general manager of operations, is equipped to furnish limestone of any size, thoroughly washed and screened in the washing plant recently installed. It has been further augmented by a 20-ton Link-Belt locomotive crane and batcher bins. The plant has a capacity of 750 tons of crushed stone a day.

Cape Girardeau Quarry Has Hundred-Year Supply

C. M. Butler, a chemical engineer of the Marquette Cement Manufacturing Co., made the statement at a recent meeting of the Optimist Club that he estimated there was a sufficient supply of limestone at the Cape Girardeau, Mo., plant to continue production for another hundred years. Mr. Butler told interestingly of the manufacture of cement and, to show the immensity of operations, said that the plant operating on a basis of 4,000 bbl. of cement daily requires 1,300 tons of stone and uses about 5 car-loads of coal in the manufacturing process.

Farmers Increase Buying of Agricultural Stone

In recognition of their record of operating their quarry throughout the entire year of 1934 without a lost-time accident, the Glens Falls Portland Cement Co., Glens Falls, N. Y., has been awarded a certificate of honorable mention by the U. S. Bureau of Mines. The award was made in accordance with rules governing the national safety competition for having operated 55,588 man-hr. with an accident-severity rate of 0.000 days lost for each 1,000 man-hr. worked during the year.

★ The Northern Blower Co., Cleveland, O., reports an order for dust-collectors to be installed in the packing department of the Ash Grove Lime & Portland Cement Co., Chanute, Kan.

Belgian Cement Firms Will Regulate Output

CARTEL HAS BEEN ORGANIZED

Belgian cement manufacturers have set up a cartel and have begun operations under the Belgo-American trade agreement. In response to the government's appeal in connection with the recent currency devaluation, negotiations, which had been in progress for several years, have successfully terminated and several agreements are to be signed shortly for regulating production and sales and for standardizing the various brands of cement on domestic and foreign markets. The first agreement of the series, dealing with artificial Portland cement (by far the most important), was signed on July 10, 1935.

A special joint stock company with a capital of 1,000,000 francs is to be set up to supervise the cement industry. The main object is the repartition of orders among the signators under an agreement which is valid up to 1939. The company will appoint agents to contact cement manufacturers operating in the principal export markets, namely, Netherlands, France and Ireland.

According to views expressed by some high officials of the cement industry the reduction in duties under the reciprocal trade agreement with the United States are not likely to result in a substantial increase in Belgian cement exports but should make the business more profitable to the Belgian manufacturers, provided export prices may be maintained.

During the first half of 1935 the Belgian cement industry operated at an estimated rate of 41.8 per cent. of potential capacity. Despite the economic depression home consumption developed favorably in 1933 and in 1934 reached 1,541,000 metric tons, slightly more than the consumption in 1931, although substantially less than in the "peak" year, 1929, when 1,783,000 tons were taken by the home market. No cement was used for road surfacing in 1930 but in 1933, 60,000 tons, and in 1934, 120,000 tons were used for this purpose. Concrete slabs are also largely employed for the foundations of highways surfaced with other materials. Public works for civil and military purposes have also contributed to the increase in domestic demand.

Worcester Gets Plant to Bituminize Aggregates

★ The Warren Brothers Roads Co. of Boston, Mass., recently installed an aggregates-bituminizing plant for the General Crushed Stone Co. at Worcester, Mass., using Niagara screen and a Pratt-Daniel dust collector. This plant is equipped for both hot and cold mixes.

Accidents Numerous in Pits and Quarries

VARIETY OF TYPES REPORTED

An increase in the number of accidents occurring in pits and quarries seems to be indicated by recent reports from various parts of the country. A few of the many types of accidents reported are listed below:

Santo Addario, an employee of the New York Trap Rock Co. at Verplanck, N. Y., has been awarded $656 in Workman's Compensation Court, due to the fact that an accident to his right foot cost him 40 per cent. of its normal use.

Charley Hinson of Bono, Ark., suffered possibly serious internal injuries when a bank caved in at the Cotton Belt gravel pit. He was standing between the bank and a steam shovel, picking up large rocks, when the gravel began sliding and almost covered him up before he could get out of the way.

Clarence Kennedy, 41, died on Aug. 23 as the result of injuries received when gravel caved in on him while working in a gravel pit in Somer Township, near Champaign, Ill.

Harold Morris of Formoso, Kan., a workman, sustained a broken arm, and a brakeman by the name of Thornberg a badly bruised leg when a train bringing in a water car struck some of the construction work in an accident at the Rock Island Railway rock quarry near Mankato, Kan.

Karl Brade incurred severe injuries on face, hands and body at the old railroad rock quarry northwest of Marysville, Kan., due to the accidental discharge of a percussion cap believed to have been left in a drill hole by blasters several years ago. He may lose the sight of one eye. Ten other workers escaped injury.

Edgar Jones, 36, Hannibal, Mo., crane operator at the Marblehead Lime Co. quarry, suffered a fractured left leg and severe bruises to his right leg when struck by a heavy rock. Company officials said that apparently he did not get under cover quickly enough after a blast had been set off.

J. H. Baugh, 59, Carthage, Mo., was severely injured when he stumbled on a loose board and fell 16 ft. from a catwalk in the big shed of the Carthage Marble Corp., landing on a marble slab.

Charles J. Fitzgerald, Jr., electrician at the Hudson, N. Y., plant of the Universal Atlas Cement Co. for the last ten years, sustained major burns about the head, face and hands when a flame shot out of an electric fuse. However, it is deemed certain that his eyesight will be saved and that he will suffer no permanent facial disfigurement.

George Jennings, 39, employed by the New York Trap Rock Corp. at Stoneco, N. Y., sustained severe scalp wounds when hurled from a truck which got out of control.

Fred Pour, Sidney, O., was badly injured when a load of gravel fell on him, crushing him against the wagon he was driving, while working in a gravel pit south of Newport.

Edward Yoder, 38, suffered a fractured left foot when a rock fell while he was working at the Warren Ferner stone quarry near Somerset, Pa.

A. G. Simmons, 55, Glenville, W. Va., was severely injured when a half-ton of rock fell on him while working for the Allied Products Co. at a quarry 2½-mi. Allied Products Co. at a quarry 2½ mi. from Glenville.

Mario Rinauldi, 19, Trenton, Mich., a brakeman of the Solvay Process Co., was instantly killed when he fell beneath a train of railroad cars at the Sibley Quarry of the company.

When his right hand became entangled in a cable on the loading dock, Roy Baker, a quarryman in the employ of the Tobin Co., north of Nebraska City, Neb., incurred severe injuries, the loss of one finger, and the fracturing and lacerating of two others.

In a gravel slide at the gravel pit 7 mi. east of Pryor, Okla., Walter Jenkins, 25, was almost instantly killed, and Nathan Roy and Geo. H. Brown were injured. All three were CCC camp employees. With several others, they had finished loading a truck and were waiting for another truck, when the slide came without warning.

Lone Star Nazareth Plant Gets $50,000 Betterments

It is reported that the International Cement Corp. is planning extensive improvements to its Lone Star plant at Nazareth, Pa., and the contract has already been awarded to M. A. Long & Co., contractors. The construction will consist of a new crusher building and a new rock-storage building, and the estimated cost of the work is about $50,000. An overhead crane, having a capacity of 7½ tons, will be installed in the rock-storage building. The entire job is to be completed in the latter part of this year.

Diesel Engine Replaces Steam Plant at Quarry

★ The Blosser Stone Co., Paulding, O., in rebuilding its plant, recently, installed a 125-hp. Buckeye Machine Co. Diesel Engine, which replaced a steam plant. The crushing plant is direct-connected to the engine, and a small generator belted to the flywheel of the Diesel furnishes electricity for pumps and small motors about the plant.

Wisconsin's Aggregates Industry Code in Force

A code embracing 150 concerns, with a total employment roll of 2,500, for the crushed stone, sand and gravel industries of Wisconsin, has been signed by Governor LaFollette. This is the eleventh code of fair competition under the new Wisconsin Recovery Act to be signed by him.

The maximum hours are 40 per week, and time and one-third for overtime; clerical help is limited to 42 hr. per week, delivery men 48 hr. and watchmen 60 hr.

Minimum wages range from $12 to $15 per week for office help, depending upon the size of the city, and are 40c an hr. for regular help.

Universal's Northampton Plant Gets Collectors

★ The Parsons Engineering Corp., Cleveland, O., recently installed three oval-bag dust arresters on Bates Valve packers at the Northampton, Pa., plant of the Universal Atlas Cement Co.

Useless By-Product Turned into Gypsum

SYNTHETIC PLANKS AVAILABLE

The development of synthetic gypsum, claimed to be superior in many respects to the natural mineral, is reported by Clarke F. Davis of the American Cyanamid & Chemical Corp., New York, N. Y. Utilizing calcium sulphate from the waste of phosphoric-acid manufacture, synthetic planks are now available to the building industry.

By the new process, according to Mr. Davis, a useless by-product, offering major disposal problems, is turned into gypsum, which is especially valuable, since the plant is located in the heart of the New York metropolitan area with the nearest natural gypsum mines more than 400 mi. away.

Calcium-phosphate rock is mined in Brewster, Fla., and shipped to Warners, N. J., where it is treated with sulphuric acid to produce phosphoric acid. In addition to the acid more than a ton of gypsum slurry results per ton of rock treated. Phosphate rock contains impurities, just as gypsum rock does, but the high temperature and the action of the sulphuric acid eliminate practically all these impurities with the exception of a slight amount of silica, which has no injurious effect on the gypsum.

The finely-divided gypsum slurry is mixed with salt water and pumped approximately 2 mi. through an 8-in. pipe to the plant of the gypsum division of the corporation, where it is washed and treated to neutralize the trace (less than 0.5 per cent.) of phosphoric acid remaining.

McGrath Given Largest Contract in Its History

The McGrath Sand & Gravel Co. of Lincoln, Ill., has received an order to supply 80 train-loads of sand and gravel for construction of Federal lock project No. 13 on the Mississippi River. This will require 200,000 tons of material, involving the production, washing and shipping of 4,000 carloads, and is the largest order in the company's 27-yr. history. The lock is to be built by the McCarthy Improvement Co. of Davenport, Ia., and the cost of the project is slightly under $2,000,000.

★ A Hardinge Type BS constant-weight feeder, sold to the Pennsylvania Salt Co., Natrona, Pa., for 99½ per cent. or better accuracy has successfully met the requirements.

★ Winston Bros. Co. at Freda, Calif., recently purchased two Austin-Western jaw crushers, one 18-in. by 38-in., and the other 4-in. by 40-in.

Editorials

The Breathing Spell

FOR a long time we have heard the cry for a let-up in what were called the attacks of government on business, for a "breathing spell" in which business men could take stock of themselves, plan definite programs of advance, and take the forward step. When the pressure of governmental oppression was removed, we were assured, business would move forward with confidence and the depression would be at an end. Unemployment would cease, prices would become settled at equitable levels, demand would increase, and our troubles would be over. And for an equally long time we have seriously doubted the sincerity of those who held that government was always wrong, the agency to be blamed when business did not improve and the one not to be credited when business became better. It was hard to believe that government could have the will and the power to injure business and yet that it could not have the desire and the means to help it.

More than one business man who adopted and prided himself on the possession of this point of view loudly proclaimed to us their intention to part with portions of their surplus cash for the reëmployment of workers and the modernization of their equipment "as soon as Congress adjourns." Others protested against the charge that these changes were as necessary then as when that longed-for event might take place. Having apparently lost for the time their own power of initiative, having lost too, perhaps, the courage needed to embark on the execution of programs already drawn and approved, and having lost, we are certain, most of their natural faith in the economic soundness of the country and even, also, in the natural goodness of life—having lost some of these qualities so essential to progress and straight thinking, they stilled their own fears and satisfied their own objections by pointing to Capitol Hill with one hand and to the calendar with the other as the causes for their reluctance to move. "Remove the pressure and watch us step out," they might as well have said.

Business has always had the power to help itself; this is no less true now than under the N.R.A.; it was no less true then than under the indifferent aloofness of the guardians of the "profitless prosperity" which preceded it. Business could never have reached the proportions of 1929, if it had not learned the art of protecting and advancing its own interests. Its continuous rise for many decades was sufficient proof of this capacity to anyone but a man deaf to the appeals of facts. What reason could anyone give for expecting that a quality so deeply inherent in the basic principle of business could be invalidated or even dangerously impaired by a change in government administration. Only a lie-down-and-die defeatism can explain the rapid loss of confidence on the part of business men, and only a stubborn determination to make a virtue of its grief can apparently account for the long-drawn-out continuation of the paralytic inactivity that followed.

We regret that it seems necessary to paint such a dismal picture of the attitude of hordes of American business men toward their opportunities. We regret that they have so long delayed the making of important decisions, that they have dawdled so long in finding a way to meet the constantly-developing wants of a constantly-growing population, that they have been content to wear so long the sackcloth-and-ashes attire of beaten men. We regret that they do not seem to be able to see that this timidity, this hanging back and dragging down, is the most un-American thing in America to-day, more insidious in its working, more subversive in its effects, than any of the "isms" that have stalked across the stage in years. Paid speakers spread false fears about the undermining of our institutions, about the evils of political dictatorships both abroad and at home, about the encroachments of government in the field of business, about the imminent dangers of state socialism, while business men slump in their club chairs, wring their hands and cry, "What, oh, what is to be done?"

Will not someone rouse these temporarily impotent men from their lethargy? Are they so accustomed to holding their breath that they can not take advantage of the breathing spell for which they prayed? Must business return to the husbandman stage or move on to a socialistic stage simply because these men have become inured to inactivity, insensible to reason, and deadened to the appeal of opportunity? Let us bring out these men who shouted for an opportunity to move forward and see them perform their steps! Let us rally these prophets of deferred expansion, these glib pleaders for *mañana, mañana*, and get them started again on the track they used to know and follow so well! Let us see if this breathing spell will not furnish the second wind for a new race back to sanity, sincerity and profits!

The Constitution and Business

CONSTITUTION DAY has come and gone and once again the American people have been treated to the same old self-laudatory speeches, the same old platitudes about the wisdom of our ancestors, and the same old Pollyanna assurances that everything will be all right if we only take our hands off that ancient document. Reports seem to show, however, that there was somewhat less than the usual amount of gullible applause, the American mind having apparently made some progress forward, even if the Constitution has been allowed to remain as it was. One hears a considerable amount of serious discussion about the need for amending the Constitution, to bring it somewhere

near the social, political, commercial and intellectual standards of our day, despite the fact that newspapers continue to look upon it as an instrument drafted by men of superhuman intelligence who were guided by a Providence bent on insuring the future of this "chosen people" against the vicissitudes of changing times. Too much of the puerile nonsense offered as rational excuses for preserving venerable antiquities comes from men who should, but seldom do, control their thinking and weigh their words and to whom a populace looking for leadership should be able to turn for help. In a period of great national stress, when the social gains of civilization have been gravely endangered, when business has been wracked and torn by the rivalries of fiercely conflicting interests, and when the way toward the goal is still obstructed by cloudy thinking and the reciprocal castigations of self-seeking individuals, the best that is offered to a people needing work and wages, orders and profits, is the smiling assurance that what is is best. The doctrines of *laissez faire* carry no conviction to a people demanding progress, to a people tired of marking time and languishing in the slough of despair.

It may be necessary to change the Constitution in order to legalize some of the things that a government ought to do to sustain a modern social and economic order, but whether such action is needed or not, we should be able to place ourselves in that intellectual attitude that will make sensible discussion and clear thinking possible. We should be able to face that possibility without the groaning of offended prejudices and without the fear of experimentation. We should be able to look upon the Constitution as we do upon any other human document, as the work of men who were politically no more statesmanly, morally no more honest, socially no more altruistic, and intellectually no more gifted than the same types of men of our own day. We should be able to liberate our approach to a discussion of constitutional changes from the ancestor worship, the partisanship, the indolence and the indifference that prevent the free expression of honestly-formed opinion and from the intolerant and addle-pated mouthings of those who oppose all change simply because it is change.

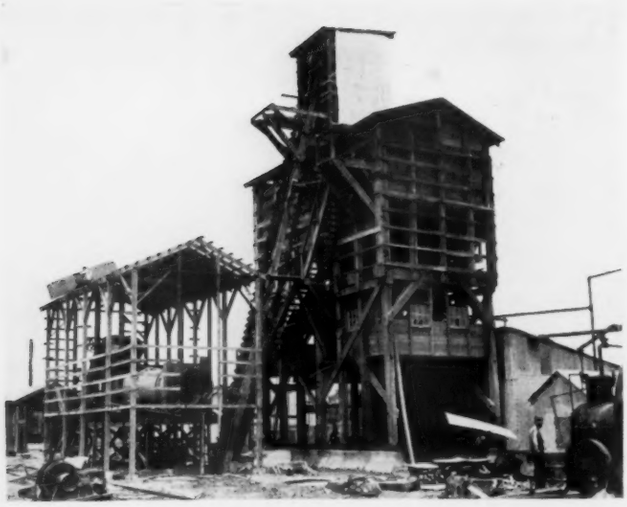
BUSINESS men have a deeper interest in this question of constitution changing than many of them realize. Some of them look upon the Constitution as the protector of their rights to perform antisocial acts, many of them probably view it as a comfortable safeguard of the rights of property and contract, most of them have never read it or spoken of it between the day of graduation and the coming of the "new deal". To all these varieties of business men an amended constitution is likely to prove less dangerous than a scrapped constitution without acceptable substitution. One could name several options more threatening that the one of amendment.

The ability to change his mind is one of man's greatest gifts, although cynics may think that it has deteriorated through lack of use. Adaptability to new circumstances, flexibility in the presence of changing conditions, readiness to discard what has outlived its usefulness in favor of a tool better suited to modern needs, is a quality that has brought man up from the ooze, socially as well as biologically. Why, then, stand in the way of changes that may mean substantial gains for humankind, why raise one's hands in holy terror when there is talk of modification, why turn pale at the thought of altering what its very authors recognized as a temporary and mutable device? If we are doubtful of the ability of any of our contemporaries to devise workable methods for social and economic advance, why be so *naïvely* trusting in the ability of men three generations past? Is it logical to hamper our efforts to improve the conditions of life for the living and those yet to come by insisting upon the omniscience, the integrity, the infallibility, the foresight and the sincerity of purpose of men long dead, of men who unfortunately lacked many of the advantages of education and experience that are open to us and who certainly could see no farther into their future than we can into ours? How can anyone achieve progress by looking backward, how can we hope to do anything worth-while for the future by leaning on the limitations of knowledge and the too-long-settled prejudices of the past?

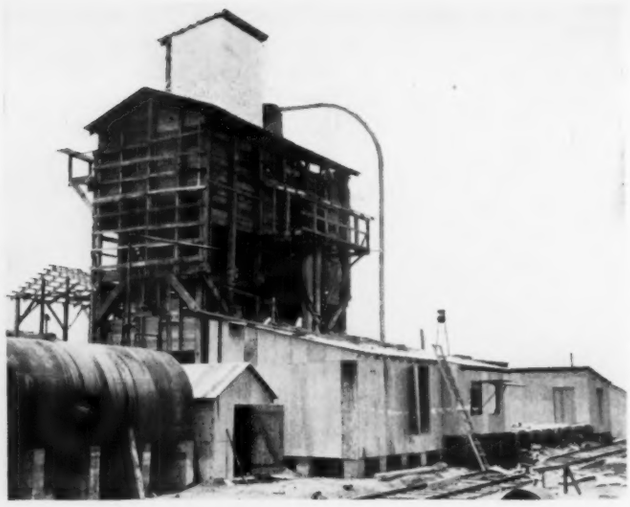
WE have no pet plans for the modification of the Constitution, nor have we any substitutes to offer. But we are curious to know how many men, who claim to be thoughtful students of their environment, really want to raise their hands in defense of stagnation, really want to confine public thinking to the thought-limitations set down nearly a hundred and fifty years ago, really want to admit that the job has been finished and that they are through thinking.

Let us face this Constitution problem squarely. Let us not sidestep it on the score of the sanctity of the document. Let us not walk around it out of a fear of disturbing something that was settled only with the expectation that it would some day be unsettled. Let us not credit its framers with supernatural wisdom, or with devilish conceit, unless we at the same time acknowledge our own incompetence and lack of vision. Let us not stalemate ourselves in an attitude of adamantine stubbornness by setting ourselves granite-like against all change.

Instead, let us view the problem sensibly. Let us prepare ourselves mentally by recognizing the possibility of change, the likelihood of change, say even the inevitability of change, in our bill of rights as in any other human product. Let us make ourselves ready to accept modification as a lesser evil than destruction and as a more sensible method than abandonment. Let us conserve what there is of good, let us remove what we see to be bad, and let us add what we believe to be better. Business men large and small have much at stake and they will do well to remember that they have more to gain in the long run by accepting changes in the Constitution than by driving their opponents to scrapping it. True believers in the merits of the Constitution will seek to preserve them by changing it rather than to lose them by wrecking it.



View of plant showing main elevator in center and drier being installed at left.



The Colprovia plant, showing pipe from pulverizer to cyclone over batcher.

Southern Stone Producer Bituminizes Quarry Product for Road Work

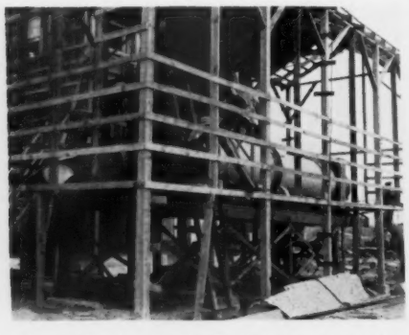
Success Warrants Moving Plant and Raising Capacity to 300 Tons Hourly

A GOOD argument in favor of the operation of aggregate-bituminizing plants by producers suitably located is the success of Colprovia Road Products, Inc., Columbia, S. C. This company first put its plant in operation in April, 1934, on the property of the Palmetto Quarries Co. just outside the city limits. A brief description of this plant under construction was published in the May, 1934, issue of PIT AND QUARRY.

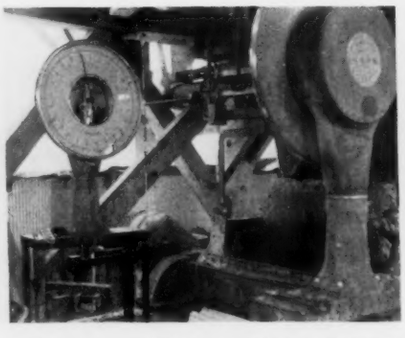
Early in 1935 this plant was taken down and reassembled on a new site 2½ mi. northeast of downtown Columbia. Many improvements were made at that time, including the installation of a new drier, and the plant was again put in operation in June, 1935. The capacity of the plant is now 300 tons per hr.

Stone and screenings are now shipped 3 mi. by railway from the Palmetto Quarries Co. plant. Limestone dust is also received by railway and unloaded into a storage shed. It is then fed by hand to an elevator, and a screw-conveyor carries it to a batcher. Hard asphalt is fed to a J. B. Sedberry "Jay-Bee" Size 2A-T pulverizer and, when pulverized, is blown by a fan into a cyclone which discharges it into the asphalt batcher. A small amount of hydrated lime is added to the hard asphalt at the pulverizer, both materials first being weighed on a Fairbanks platform scale.

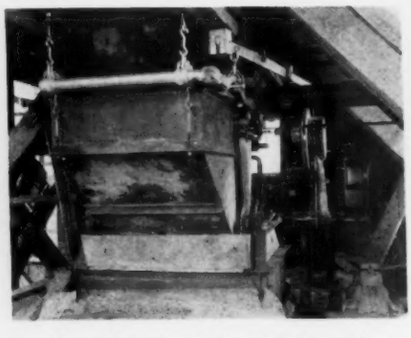
The stone and screenings are discharged from the cars into a track hopper from which a bucket-elevator feeds them to the Hetherington & Berner 5-ft. by 30-ft. direct-fired rotary drier-cooler. The drier is fired with oil which is stored in an 8,000-gal. tank. A suction fan on the drier draws the dust to a wooden settling chamber from which the air is exhausted. The dust is drawn from the chamber and used in the mix. *(Continued on page 30)*



New 5-ft. by 30-ft. drier-cooler and elevator during installation.



Scales on weighing batcher; pug-mill speed-reducer drive in background.



Another view of weighing batchers, showing scales in background.

New Wet-Process Cement Plant Begins Running in Northwestern Idaho

Down-Hill Design Reduces Handling and Greatly Simplifies Material Flow

By W. E. TRAUFFER

THE productive capacity of the Portland-cement industry in the United States was further increased, when the new plant of the Washington-Idaho Lime Products Co., at Orofino, Idaho, went into operation on Sept. 26. Construction of the plant was begun early in April. It has a present capacity of 240 bbl. of cement per day, which can be considerably increased by the installation of additional raw- and finish-grinding tube-mills. The wet process is used and the plant flow is as simple as present practice allows. A minimum of handling is necessary due to this simplicity and to the down-hill design of the plant.

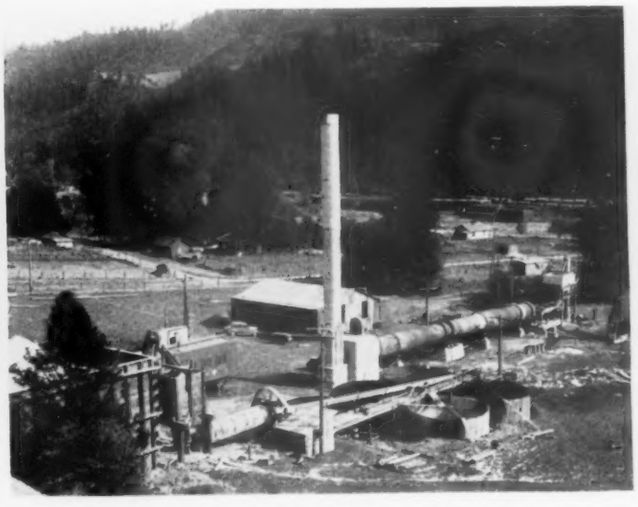
The plant is on the property once owned by the Orofino Portland Cement Co., which in 1913 prospected the deposit and began the construction of a plant which was never completed. The records of the tests made then are in the hands of the present owners. The deposit of 240 acres is known to contain an almost unlimited amount of suitable material above the present quarry level. The plant is at the foot of this mountain of rock, which rises about 1,500 ft. above the quarry level.

In this deposit are high- and low-grade cement rock and shale in such close proximity that one shovel can be used to load all the material without moving more than a few hundred feet. Analyses of three samples of raw materials made by the Pacific Testing Laboratories, Seattle, Wash., are given below:

	Sample No. 1	Sample No. 2	Sample No. 3
Silica (SiO_2)	4.46%	32.84%	25.62%
Iron Oxide (Fe_2O_3)	0.48%	1.04%	1.23%
Alumina (Al_2O_3)	1.90%	9.36%	13.21%
Lime (CaO)	52.23%	32.83%	28.96%
Magnesia (MgO)	0.32%	Trace %	1.56%
Loss on Ignition	40.50%	23.58%	28.94%
	99.89%	99.65%	99.52%

The rock near the surface which is now being excavated is so soft that it requires no blasting. Later, however, harder rock will make this necessary. A Bucyrus 20B crawler shovel with a ¾-cu.yd. dipper and powered by an Atlas Diesel engine loads the material into a Ford V-8 truck with a 3-cu.yd. dump body. The material is dumped into the Cedar Rapids 36-in. by 9-in. jaw primary crusher. This reduces the stone to 1½-in. minus and feeds it to a Jeffrey 24-in. hammer-mill which reduces the material to 20-mesh and under. A short 16-in. belt-conveyor feeds the crushed material to a 24-in. by 70-ft. centers horizontal belt-conveyor which can discharge through a 3-way split chute to any of three compartments of the 1,200-ton timber storage bin. Two compartments are being used for stone high in lime and the other for low-lime stone. If it should ever be found necessary to use shale in the mix, one of the compartments can be used to store this material.

The new Washington-Idaho cement plant at Orofino as seen from the primary crusher.



View from the quarry, showing raw-material tube-mill in center and slurry banks at right.

Coal elevator and bin with quarry visible in background.

The two crushers are driven from a 75-hp., 2,300-v. Westinghouse motor through a belt and a lineshaft. A 5-hp. General Electric Western gearmotor drives the long belt-conveyor, while the short conveyor is driven by chain from the tail pulley.

Side-discharge gates in the bin compartments allow discharge of the raw materials on a 30-in. by 60-ft. horizontal belt-conveyor. These gates are calibrated so that a rough blend can be made at this point. The raw material is discharged into a 26-ft. belt-bucket-elevator which discharges it into the 25-ton raw-grinding mill-feed bin. A table feeder sends the raw material to the 4½-ft. by 20-ft. Colorado Iron Works tube-mill. This is lined with step-ribbed plates and is loaded with 2½-, 1¼- and ⅝-in. white-iron balls. Water is introduced to give a slurry moisture content of about 35 per cent. Grinding is done to a fineness of 92 per cent. through 200-mesh.

The reclaiming conveyor and the elevator are driven by a 5-hp. G. E. motor through chain. The tube-mill is driven through belt and gear by a 125-hp. Westinghouse motor and the feeder is chain driven from the mill.

The slurry is discharged from the mill by gravity through troughs into any of six steel slurry tanks, each of which is 8 ft. high and 22 ft. in diameter. These tanks are equipped with combined mechanical and air agitators. A 2½-in. centrifugal sand pump can feed slurry from any tank to any other tank to obtain the desired blend. A second similar pump feeds the slurry to a Ferris-wheel kiln feeder mounted on the concrete dust chamber at the feed end of the rotary kiln.

This feeder discharges the slurry through a spout into the 7½-ft. by 7-ft. by 125-ft. rotary kiln, which is lined with 7-in. firebrick in the burning zone and 5-in. brick throughout the remainder of its length. Heavy chains suspended by only one end are installed in the feed end of the kiln to facilitate the exchange of heat and to prevent lumping of the material and the formation of rings.

The kiln is supported on 4 rings having cradle-swing type roller supports. It is driven through belt and gear by a 25-hp. G. E. motor. Each of the slurry agitators is driven by a 3-hp. Century electric motor through a gear reducer. The slurry pumps are driven by 5-hp. G. E. motors and the Ferris-wheel feeder is direct-driven by shaft and chain from one of the kiln-carrying rolls.

Feed end of kiln with stack, Ferris-wheel slurry feeder and seal ring.

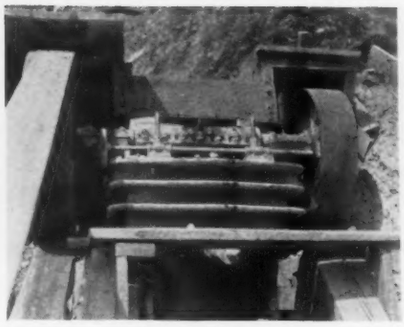
The clinker drops from the kiln through grates into the 4-ft. by 30-ft. rotary cooler. This is lined for one-half its length while the remainder has 6-in. lifters. The cooled clinker is discharged into a 22-ft. chain-bucket-elevator which discharges it to a storage pile. A drag-scraper will spread the clinker in storage, which, it is estimated, has space for 50,000 bbl. The same scraper will reclaim the

The raw-material tube-mill with feed bin at right and quarry and shovel in background.

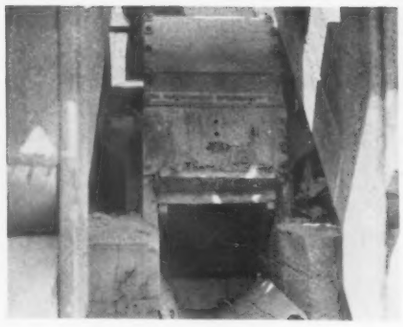
Raw-material crushing and storage plant with conveyor for reclaiming rough blend from bins.

The finish-grinding tube-mill with feed bin. Coal bin and elevator visible in background.

Crushing plant and belt-conveyor to raw-material storage.



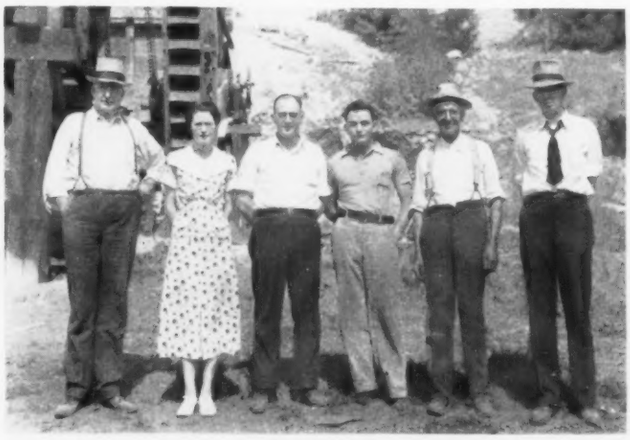
The primary crusher, a 9-in. by 36-in. unit.



The 24-in. hammer-mill above conveyor to raw-material storage.

clinker from storage to an inclined belt-conveyor which discharges it into the feed bin over the preliminary finish-grinding unit. This is a 16-in. by 36-in. Colorado roll crusher which will reduce the clinker to about 20-mesh. A 33-ft. chain-elevator will feed a bin over the finish-grinding tube-mill, which is identical with the raw tube-mill. A capacity of about 240 bbl. per day of material running 95 per cent. through 200-mesh is expected to be obtained.

Gypsum is unloaded by hand from cars into a hopper, from which a belt-conveyor feeds it to a bin over the crushing rolls. The gypsum and clinker will be proportioned by means of volume-measuring boxes.



Left to right: E. J. Simons, president; Miss Martha E. Simons, assistant chemist; C. T. Pinkerton, chief chemist; Dwight Kinsey, mix chemist; Burton B. Pierce, superintendent; E. J. Simons, Jr., vice-president.

The clinker elevator is driven by a 5-hp. G. E. motor; the roll crusher is belt-driven by a 25-hp. G. E. motor, and the tube-mill by an 85-hp. Westinghouse motor.

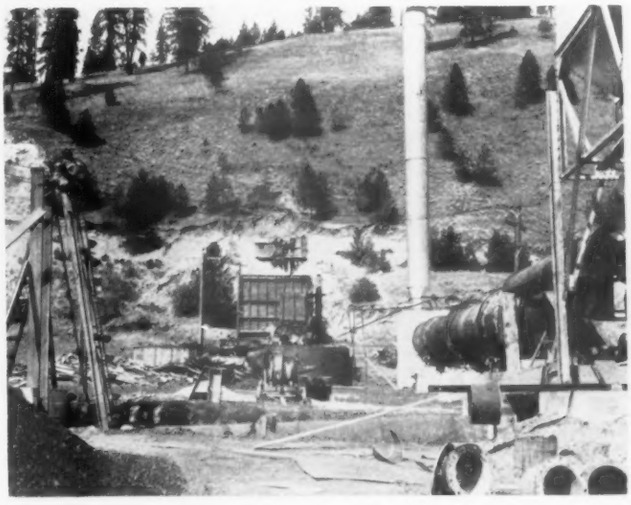
The finished cement is discharged from the tube-mill into a 33-ft. chain-bucket-elevator. A screw conveyor then feeds it to two 2,750-bbl. timber storage-bins which will later be replaced by six concrete silos. Cement is reclaimed from storage by a drag-scraper which feeds it to a 12-in. by 70-ft. screw conveyor. Cement in the bins is aërated to make it flow freely to the scraper. In the packhouse the cement is discharged into a 33-ft. bucket-elevator and is passed through an 18-in. revolving screen to a 150-bbl. steel bin over the Bates 3-bag packer. The spilled cement from the packer goes by gravity to the last-mentioned elevator. Bagged cement is loaded with hand trucks into cars or trucks for shipment. Provision is also being made for bulk shipments.

The screw conveyor, screen and elevator are driven from a 10-hp. G. E. motor and the packer by a 20-hp. G. E. motor.

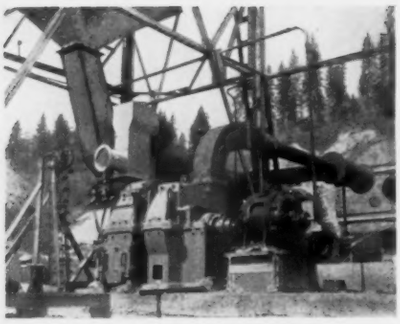
Coal is unloaded from cars to a drag-scraper feeding the 30-ft. bucket elevator. It is fed from a 30-ton Butler steel bin direct to the Raymond No. 50 Imp. mill which dries and grinds the coal and blows it to the kiln. A fan in the mill housing draws hot air from the cooler through the mill, carrying the dried, pulverized coal through an 8-in. pipe to the kiln. A Western 48-in. blower is so connected that it can draw hot air from the cooler and blow through an 18-in. pipe around the coal-feed pipe. This arrangement is intended to be used only when high capacity is desired. Each fan is gated on both sides to allow regulation of the draft. The steel kiln stack is 6 ft. in diameter and 85 ft. high and has a concrete dust chamber and housing.

The coal elevator is driven by a 5-hp. G. E. motor, the mill by a 50-hp. Westinghouse motor and the auxiliary fan by a 15-hp. G. E. motor.

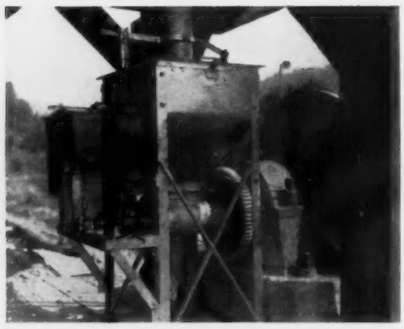
Power for operation of the plant is purchased from the Washington Water Power Co. at 2,200 v. This voltage is used on the large motors but is re-



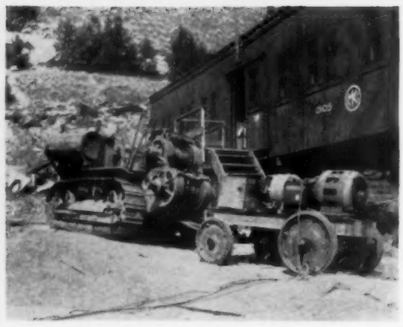
Firing end of kiln with cooler and clinker elevator at left. Slurry tanks in left background.



The mill for pulverizing, drying and blowing coal into kiln.



The table feeder which carries blended raw materials to the raw mill.



The crawler tractor, equipped with hoists, hauling electric-welding outfit.

duced to 440 for all others. Most of the electrical equipment is Westinghouse, including the switchboard, circuit-breakers, etc.

Water is obtained from a dug well. A Fairbanks-Morse plunger pump raises the water to an 8,000-gal. tank on the hillside above the plant, giving it a 95-ft. head. The plant machine-shop is equipped to do any general repair work, and the plant laboratory to make all the usual chemical and physical tests except compression. An interesting unit is the moist closet which consists of a Frigidaire refrigerator with the cooling unit removed and is equipped with fog sprays.

Most of the equipment used in this plant was supplied or made by the General Machinery Co., Spokane, Wash., new and used equipment dealers and manufacturers, of which Mr. Simons is also president. Among the equipment made by this company are the slurry-blending tanks and agitators, slurry pumps, belt-conveyors, bucket-elevators, kiln seal ring, etc. The Raymond coal mill is the only important new piece of equipment used in this plant.

The officers of the Washington-Idaho Lime Products Co. are E. J. Simons, president; E. J. Simons, Jr., vice-president; Earl Smith, secretary and treasurer. Burton B. Pierce is plant superintendent, C. F. Pinkerton is chief chemist, Miss Martha E. Simons and Dwight Kinzey are assistant chemists. Miss Simons was graduated in chemical engineering from Washington State College and received her master's degree at the University of Washington. Her previous experience in the cement industry was obtained at the Idaho Portland Cement Co., Inkom, Idaho.

Bituminizing Plant *(from page 26)*

The dried aggregate is discharged from the drier into the buckets of a Link-Belt elevator operating on 61-ft. centers. This discharges it into a small hopper fitted with gates which allow the material to be discharged into any of four bins having a capacity of 50 tons each. Two of these are now used for screenings and the other two for the ⅜-in. to 1¼-in. stone. Gates feed from these bins to the Hedges-Walsh-Weidner Co. 1-ton capacity aggregate batcher. This is equipped with a Kron dial scale and weighs both the dust and the stone.

The hard asphalt and lime, forming 10 per cent. and ½ per cent., respectively, of the mixture, are weighed in a smaller batcher which is also equipped with a Kron dial scale. Liquid asphalt is stored in an 18,000-gal. tank and is heated by means of a steam boiler. The asphalt is pumped to a liquid batcher on the mixer floor through a pipe-line inside which is a steam line. The liquid-asphalt batcher is equipped with a beam scale.

The contents of the three batchers are discharged to a Hedges-Walsh-Weidner 1-ton pug-mill type mixer from which the finished product is discharged direct into cars or on a belt-conveyor for truck loading. The mixer is driven through a Falk reducer by an Allis-Chalmers motor. Additional aggregate bins with a capacity of 200 tons are being erected. Link-Belt conveyors and elevators are used in this plant.

The officers of Colprovia Road Products, Inc., are: P. M. Dietz, president; and J. G. Ehrlich, vice-president. Mr. Ehrlich is also president and manager of the Southern Silica Mining & Mfg. Co. and the Sandrying Co., both of Columbia, S. C.

Lime Industry in 1934

The lime sold by producers in the United States in 1934 amounted to 2,397,087 short tons valued at $17,164,024, according to figures compiled from reports made by lime manufacturers. This represents an increase of 6 per cent. in quantity and 20 per cent. in value compared with 1933. Sales of hydrated lime, which are included in the above totals, amounted to 829,430 tons valued at $6,324,623, a decrease of 1 per cent. in quantity and an increase of 12.5 per cent. in value. The average unit value of all lime in 1934 was $7.16 a ton compared with $6.28 a ton in 1933 and 1932; hydrated lime showed an increase from $6.69 a ton in 1933 to $7.63 a ton in 1934.

Sales of lime used in the manufacture of chemicals — 1,663,591 tons valued at $11,425,031 — increased 12 per cent. in quantity and 25 per cent. in value; lime sold for construction — 511,419 tons valued at $4,260,865—decreased 4 per cent. in quantity and increased 11 per cent. in value; and that sold for agricultural purposes—222,077 tons valued at $1,478,128—decreased 10 per cent. in quantity and increased 11 per cent. in value. The total number of plants that reported operations in 1934 was 324, 8 less than in 1933.

Illinois Silica-Sand Plant Uses Diesel Engine to Generate Its Power

Produces 150 Tons an Hour and Will Operate 24 Hours Daily When Required

WHILE producers and manufacturers all around were curtailing operations, the depression gave birth to a new industrial enterprise in Illinois, whose continuous progress during the past two and one-half years has justified the original determination to push forward despite the economic warnings of the day.

George M. Pendergast & Co., producers of foundry sands, have recently completed another self-contained unit plant for producing silica sand to be used for making cores and for molding purposes in steel foundries. This new unit is located in the famous St. Peter sandstone district, on the north bank of the Illinois River, near Ottawa, Ill., and within sight of the beautiful Starved Rock State Park.

The project was started on a small scale in August, 1933, with a portable 40-ft. conveyor carrying the sand to a small wooden hopper, which emptied into a small dump car. The car traveled by gravity down a narrow-gage track to the tipple, where it automatically dumped into the freight car on the siding. A horse was used to bring the car back to the hopper. By the autumn of 1933 the new project was using two shifts of 11 men each to shovel sand on the portable conveyor and yet the company found itself behind on orders.

The new plant, designed by the Stephens-Adamson Mfg. Co., was given a preliminary trial late last autumn and was finally completed this spring. It has a capacity of 150 tons per hr. and provisions have been made for increasing this as demand requires. The sand is screened and crushed to a specification of minus ¼ in.

The deposit consists of an exceptionally pure and coarse grade of silica sand, ideally suited for core and molding purposes. At present there is a 60-ft. face, but this will be increased materially before the end of the year, when the operators expect to have an 80-ft. or 90-ft. face. There is practically no overburden. The stripping is easily done with an Insley ⅜-cu.yd. gasoline shovel and small trucks. Two men with a team and scraper quickly clean up in the wake of the shovel.

The silica face is loosened by Trojan powder shot in holes drilled in the side of the face with Star water drills. The loosened sand is carried to the field-conveyor hopper by means of a 1-cu.yd. drag-line scraper, operated by an American 3-drum hoist, powered by a Waukesha 4-cyl., 90-hp., HLL gasoline motor.

A bar grizzly over the receiving hopper passes sand and the smaller lumps. Larger lumps are easily broken up between loads of the drag scraper by a man stationed on the grizzly for this purpose. A Stephens-Adamson 30-in. by 6-ft. automatic belt feeder regulates the supply of material to a Stephens-Adamson 24-in. belt-conveyor 290 ft. long, which carries the sand to the screening plant. Here the material passes over a divider and over several stationary bar screens with ¼-in. openings, which feed it to two 3-ft. by 8-ft. Allis-Chalmers, double-deck, vibrating screens, driven by 2½-hp. Allis-Chalmers motors and having ¼-in. mesh cloth on the lower decks. The sand is discharged direct from the stationary and vibrating screens to a 24-in. Stephens-Adamson belt-conveyor. Oversize from the screens is reduced to minus ¼-in. material by a Stephens-Adamson 24-in. by 30-in. corrugated-

(Continued on page 38)

The Pendergast pit, showing drag-line hoist, grizzly and conveyor leading to plant.

Loading-out hopper showing split discharge chutes. Old track visible at right.

Concrete Aggregate for Fort Peck Dam Comes from Plant 75 Miles Away

Sized and Washed Material Used for Tunnels, Spillway, Walls, etc.

THE dam across the Missouri River, now under construction at Fort Peck, Mont., is an earth-fill dam. It is being built under the direction of the United States Army engineers and the actual dirt fill is being made by four huge United States Army engineer dredges from material adjacent to the channel above the dam. However, a large quantity of gravel is being used to form the "toe" or bottom of the slope of the main earth fill. Other large quantities of washed sand and gravel for concrete aggregate for the diversion tunnels, spillway, retaining walls, and other construction are required.

The gravel and sand for these several uses are being produced at Cole, Mont., about 75 mi. from the site of the dam. In the view of the gravel operations at Cole, shown on the opposite page, the two traveling plants shown at the right are owned and operated by the Becker-County Shiely Co. and produce the "toe" gravel at an average rate of 600 tons per hr. The stationary plant, shown at the left, is owned and operated by the J. L. Shiely Co. This plant produces the washed and screened sand and gravel for concrete aggregate. This article will describe only the stationary washing-and-screening plant.

In the early spring of 1934 a small washing-and-screening plant was erected to produce the material required for the building of the town of Fort Peck, railway ballast for the government railway, and some gravel for tunnels and other construction around the town and dam. Larger contracts then made it necessary to build a much larger plant and so the present plant was constructed in the spring of 1935. The bins from the original plant were used and other bins added for the new plant. Belt-conveyors and other equipment from the original plant were also utilized in the new lay-out.

The pit contains a good percentage of gravel between 1½ in. and 10 in., which had to be crushed as well as a large quantity of bowlders above 10-in. size. The material is excavated by a Bucyrus 2-cu.yd. electric shovel and a 1¼-cu.yd. Erie gas-air shovel. Later an electric drag-line will be moved into the pit to take out material below water. These shovels discharge into 6-cu.yd. Koppel side-dump cars, which are hauled to the track hopper by General Electric 12-ton electric locomotives operating from an overhead trolley.

A rail grid with 10-in. openings is arranged over the track hopper, on one side of which is arranged a shelf or ledge. Bowlders above 10 in. in size retained on this grid are rolled on this shelf and when a sufficient quantity has accumulated, they are rolled into trucks and stock-piled for future rip-rap stone.

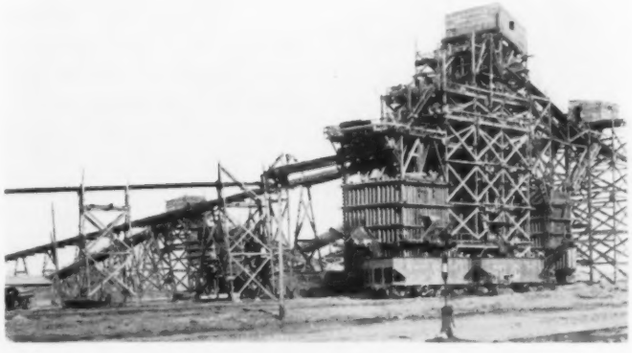
Under the track hopper are two reciprocating plate feeders, each driven by a separate motor. They are placed at right angles to the main belt and set so that they operate toward the center and deliver into a common spout discharging on this belt. Adjustable-throw disk cranks are provided to vary the length of stroke and thus change the feed. With individual-motor drives either or both feeders may operate with the stroke set to the desired capacity.

Another view of the washing plant, showing secondary crushers at center.

The J. L. Shiely Co. sand-and-gravel washing-and-screening plant for the preparation of the aggregates for Fort Peck dam.

The washing-and-screening plant at the left and the traveling plants of the Becker-County-Shiely Co. at the right.

The track hopper is located in the pit about 30 ft. below the general level of the ground at the foot of the washing plant proper. From the two feeders the material is elevated to the first scalping screen by a 36-in. belt-conveyor with a 13-deg. incline, 325-



This view shows the sand bin and conical sand-separators in the foreground.

ft. centers and a lift of about 72 ft., operating at a speed of 400 ft. per min.

The first scalping screen is a rotary unit, 6 ft. in diameter and 12 ft. long, open at both ends. It has 3½-in. openings and all rock above this size (10-in. to 3½-in.) is sent to a surge-box and then to a 20-in. McCully primary crusher.

The material passing through the 3½-in. openings in the primary screen goes into a small bin below and then to a 5-ft. by 10-ft. single-deck vibrating secondary scalping screen having 1½-in. square openings. All the material passing through the 1½-in. openings in this screen goes to the belt-conveyor leading to the washing plant.

The rejections (1½-in. to 3½-in.) from the secondary scalping screen go to a 24-in. stone belt-conveyor operating on about 150-ft. centers and a 14-deg. incline. The crushed material from the 20-in. crusher also goes to this belt-conveyor, which discharges into a rather large surge-bin about 12 ft. wide, 20 ft. long, and 25 ft. high. The material in this surge-bin is fed into two 48-in. Symons cone crushers.

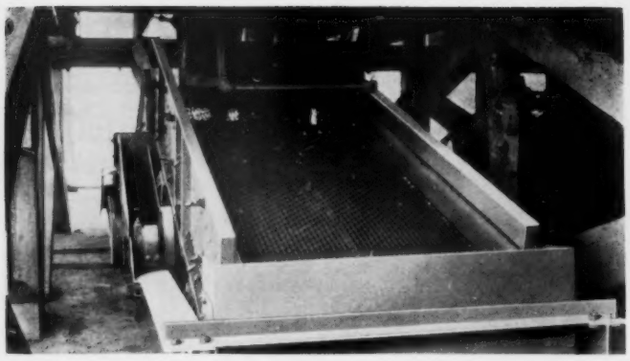
The product of these crushers is fed to a 24-in. crushed-stone belt-conveyor which is on 150-ft. centers, horizontal at the feed point and operates at a 20-deg. angle at the upper end. This conveyor discharges on two double-deck vibrating screens 4 ft. by 10 ft. in size. The upper deck has 1½-in. square openings and the lower deck ½-in. square openings.

The sand specification requires that there be no crusher dust in the sand. This accounts for the two double-deck screens mentioned. The upper deck removes any oversize and returns it to the conveyor leading to the cone crushers for recrushing. The crushed material (1½-in. to ½-in.) goes to the belt leading to the washing plant. The dust and small chips passing through the lower deck go into a dust bin under these two screens. This dust is removed by trucks from time to time and is used largely for maintaining roads about the property.

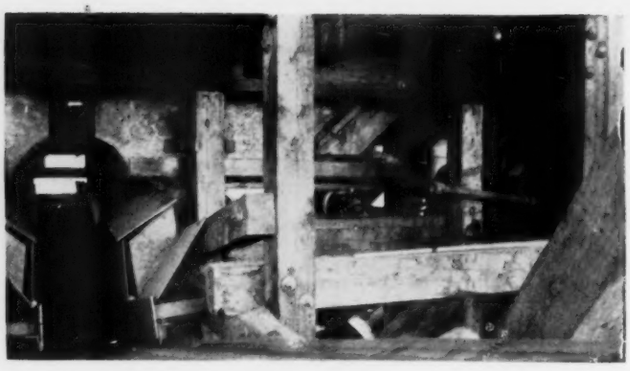
The material (½-in. down) passing through the secondary, or vibrating, scalping screen (1½-in. to ½-in.) and the crushed material passing over the dust screens, both go on to a 36-in. belt-conveyor operating on about 230-ft. centers. This conveyor reaches to a point between the two loading tracks, where it transfers the material to a second 36-in. conveyor on 87-ft. centers placed at right angles to the first and leading to the top of the washing plant. This conveyor discharges into a revolving scrubber 6 ft. in diameter and 10 ft. long. The scrubber is fitted with retarding rings and lifting vanes. It is driven through a spur-gear ring around the shell and turns on heavy wide-face endless steel tires on 24-in. diameter steel rollers.

The scrubber discharges into a distributing box arranged to split the flow equally to four vibrating screens. There are 8 double-deck 4-ft. by 10-ft. vibrating screens for washing and sizing the sand and gravel. These screens are arranged in four sets of two screens per set. The top deck of each screen is fitted with ¾-in. openings and the bottom deck with ¼-in. openings. This screen arrangement is different from the usual practice and provides a double screening for both sizes of gravel.

The distributing box mentioned above discharges its material (1½-in. down) to the four upper vibrating screens. The material (1½-in. to ¾-in.) passing over the top deck of each of the upper vibrating screens then passes to the top deck of its companion screen in the lower set of vibrating screens. The material (¾-in. to ¼-in.) passing through the top deck and over the bottom deck of each of the upper vibrating screens passes to the lower deck of its companion screen in the lower set. Thus, all the gravel ¾-in. to 1½-in.



One of the eight vibrating screens which size and wash the scrubbed material.



One of the reciprocating feeders and common spout to belt under track hopper.

has passed over two screen surfaces with ¾-in. openings and all the gravel ¼-in. to ¾-in. has passed over two screen surfaces with ¼-in. openings, providing a double screening of both sizes. The sand ¼-in. down as it passes through the lower deck of each of the 8 vibrating screens is flumed with the dirty water to the sand-separators.

The washing process starts in the spout between the last belt-conveyor and the scrubber, where a good supply of water is introduced. More water is added in the distributing box between the scrubber and the vibrating screens. Each vibrating screen is fitted with two 2½-in. spray pipes over the top deck for further washing and rinsing. The wash water is pumped from the Milk River through a pipe-line nearly 5,000 ft. long. While water is found in the bottom of the pit, this supply was not large enough to depend upon in an area having very little or no rainfall.

As has been said, the sand passing through the lower deck of each of the 8 vibrating screens is collected into two flumes. These discharge into two 96-in. conical sand-separators. All, or a part of, the overflow from these separators goes to two 72-in. conical sand-separators. The flumes are arranged so that portions of the coarse or fine may be wasted as required to take care of the variations in the material coming from the pit.

The loading bins are arranged with a loading track on each side. Normally the sand is loaded on one track and gravel on the other. The gravel-loading spouts are made with perforated bottom plates and spray pipes so that all the gravel is given a further rinsing as it is loaded into the cars. The bins will hold, above the gates, about 3 carloads of each size of gravel and the sand, or approximately one hour's operating capacity.

The entire plant is electrically driven. Most of the motors were taken from other plants of the company so that General Electric, Westinghouse, Allis-Chalmers and Fairbanks-Morse motors are all in use on the various drives.

In designing the plant it had to be remembered that primarily it would produce, over a period of two or three years, the material for one large contract, after which there would be only short seasons of possible ballast production and a very limited local demand. Thus, the entire plant was built with wood construction. It differs from the usual commercial plant in that only two grades of gravel and one grade of sand can be produced at one time. The crusher arrangement and the removal and wasting

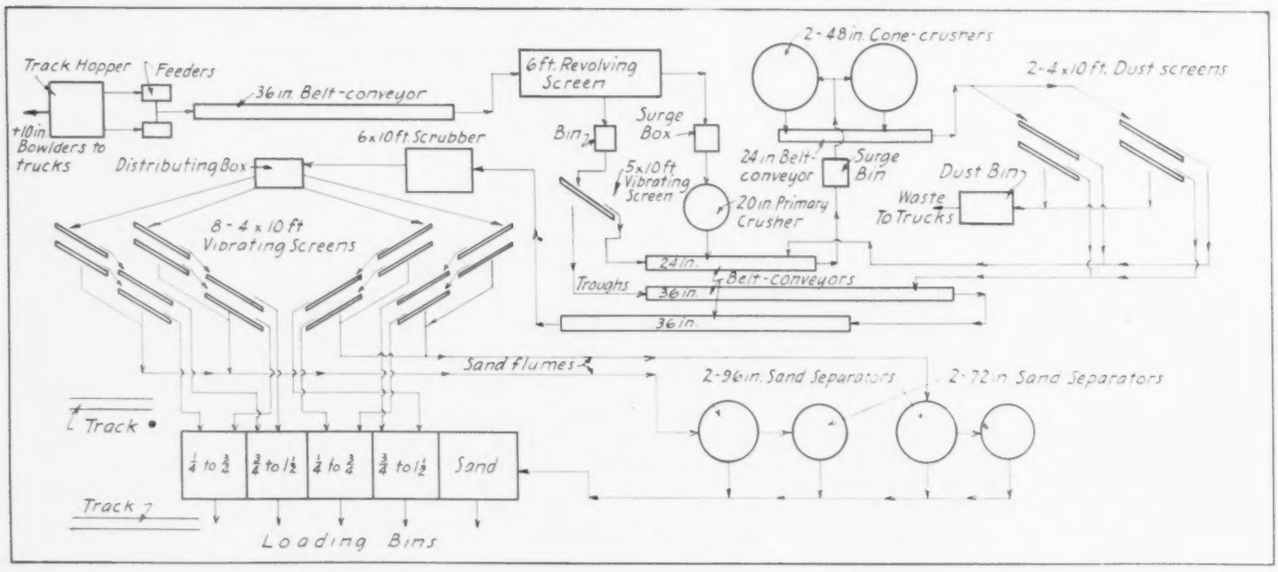


Diagram illustrating the flow of material through the J. L. Shiely plant.

View of the pit, showing shovels at center and loading out tracks at right.

Train of pit cars drawn by electric locomotive with plant in background.

of the crusher dust from the crushed gravel are not common to gravel-washing plants, although this is often done in crushed-stone plants.

The length of the conveyors and their relative positions in the lay-out were made to conform to the relative positions of side tracks, ground elevations and pit location.

The feeders, revolving scalping screen, scrubbers, sand-separators and belt-conveyor machinery, idlers and drives were furnished by the Link-Belt Co. The vibrating screens are all Link-Belt vibrating screens with the exception of one Simplicity screen used in the removal of crusher dust.

The plant was designed by the Link-Belt Co., in coöperation with J. L. Shiely and the very capable organization which he has built up. Several of these men have been erecting and operating plants for the Shiely company for over twenty-five years and the combined ideas of all were used in the design and arrangement of this plant. All the erecting of both the structures and the machinery was done by this same organization.

The nearest source of parts and supplies is nearly one thousand miles away, so that a considerable stock of spare parts is carried on hand at all times.

This plant at Cole, Mont., is one of the twelve plants designed by the Link-Belt Co. for and erected by the J. L. Shiely Co. in locations that extend from Duluth, Minn., to Seattle, Wash. All these plants are different and designed to take care of the varying pit and market conditions found at the several locations.

It has not been the author's intention in this article to go into details of the construction of the various units, the power requirements or the reasons for the choice of the different units. Instead, he has attempted to give a concise and definite description of the flow or progress through the plant from pit to cars. The flow of material and the arrangement of the various units are not suitable for every commercial plant. It is hoped, though, that certain parts of the arrangement may lead operators of other plants to think of similar applications to improve the operation of their own plants.

Cars over track hopper and conveyor leading to washing plant.

Accidents in Stone Quarries

The ninth annual safety contest, that for 1934, among quarrying and mining companies engaged in the production of crushed stone, which was conducted by the United States Bureau of Mines in cooperation with the National Crushed Stone Assn., revealed a reduction in the combined accident-severity rate for the participating companies and an increase in the accident-frequency rate, compared with 1933. The severity rate was more favorable than that for any other year since 1926, when the yearly contests were inaugurated; the frequency rate was, with three exceptions, also better than that of any other year. The three exceptions were 1930, 1932, and 1933.

Fifty plants were enrolled in the contest of 1934, including 46 open quarries and 4 underground mines. Nineteen plants were operated during the year without an accident that caused loss of time to any employee. The total volume of employment or exposure reported by the 50 plants was 3,536,403 man-hr., an increase of more than 20 per cent. over the 43 plants that participated in the safety competition of 1933.

Accidents in and about the plants during 1934 resulted in 122 injuries, one of which proved fatal and two of which resulted in permanent partial injuries to the employees. The remaining 119 injuries were of a temporary nature, although each of them disabled an employee for more than the remainder of the day on which the accident occurred. The combined accident-severity rate for all plants was 3.113 per 1,000 man-hr. of exposure, compared with a rate of 3.166 for the previous year; the combined accident-frequency rate was 34.498 per 1,000,000 man-hr., compared with the previous year's rate of 27.264.

View of the bank, showing one unit of screening plant in center background.

Plant-mixed "stabilized" gravel windrowed on the road ready to be spread and compacted.

Michigan Producer Erects Small Plant to Produce "Stabilized" Gravel

Believes Plan Offers New Market for Gravel and New Use for Overburden

PLANT production of stabilized gravel, containing specified proportions of pea gravel, clay, sand and calcium chloride, was started early in August by the Standard Gravel Co. of Pontiac, Mich., at its pit near New Hudson. Production of the new type gravel mix opens a new market for the company's products and provides a means of utilizing a portion of the clay-sand overburden at the pit. The original order on which production was started was for 5,000 cu.yd. of the material for the Oakland County highway commission.

The stabilized mixture is produced in a mixing plant in the company's yard, ready for application to the road. The finished mixture contains specified proportions of the clay-sand overburden and pea gravel, calcium chloride, and water. The plant has a capacity of 25 cu.yd. an hour and feeds the various materials automatically. F. A. Slater, general manager of the company, designed and built the plant, for the most part using material already on hand. He estimates the cost of the plant, exclusive of the shovels used, at approximately $3,000.

Owing to the nature of the pit, the machinery used in producing the stabilized mix is arranged in two separate units. A screening plant for screening and pulverizing the overburden is established on the top of the bank some distance from the yards. From this unit sand-clay screenings are trucked to the yard, where the mixing unit is located adjacent to the pea-gravel stock-pile. The mixing plant consists of a divided hopper, feed gates regulating the flow of the soils, a meter feed for the calcium chloride, and a pug-mill or paddle-type conveyor.

From the stock-piles adjacent to the plant the sand-clay screenings and the pea gravel are fed into the hopper by a Bucyrus-Erie electric crane equipped with a Page 1-cu.yd. clam-shell bucket on a 45-ft. boom. The hopper is 12 ft. square at the top and 2 ft. square at the bottom, having a capacity of approximately 12 cu.yd. A 24-in. plate feeder at the bottom of the hopper feeds the soils into the pug-mill, the flow being regulated by gates. A 12-in. steel plate above the plate feeder, with a board partition continuing to the top of the hopper, forms two bins, one for the overburden and the other for the pea gravel. In this instance the mixture is about 60 per cent. of the overburden to 40 per cent. pea gravel, but the mixture can be regulated in any desired proportions by adjusting the gates.

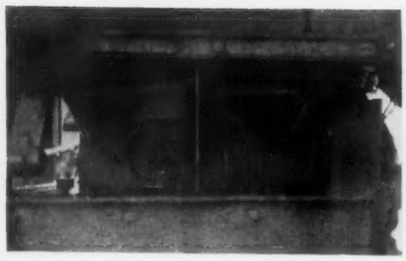
The pug-mill in which the mixing is done is 20 in. wide and 7 ft. long. The flow into the mixer is first the pea gravel, then the clay-sand screenings, then the calcium chloride, and finally the water. This

Steam shovel loading material into screening plant.

Mixing plant of the Standard Gravel Co. at Pontiac, Mich.

The same crane which loads the hopper loads the trucks.

Adding calcium chloride and water to soils in mixer.



Hopper discharging soils over plate feeder into pug-mill.

Finished material being discharged for stock-piling.

allows a short period of dry-mixing before the water is added.

The addition of the calcium chloride to the mixture is regulated by a meter feed devised by Mr. Slater. The meter is 4½ in. in diameter and consists of short fins attached to a revolving shaft with round plates on each side of the fins. Thus, triangular openings are formed and these may be left open or closed with small plates to regulate the feed to any desired quantity. A piece of steel pipe surrounds the meter preventing any excess fall of the calcium chloride. In the mixture produced for the county calcium chloride was added to the mix at the rate of 12 lb. to the cu.yd.

From the pug-mill the stabilized mixture passes into a pit, from which it is stock-piled or loaded directly into the trucks. Wet mixing is deemed advisable by Mr. Slater to prevent segregation of the soils. In dry-mixing, Mr. Slater believes, the pebbles would have a tendency to roll to the outside of the pile, while the clay and sand would stay in the center. Only enough water is used to give a slightly moist mix to prevent this segregation. This addition of the water at the plant also reduces the amount of water needed on the road, when the surface is being laid and compacted.

Loading of the trucks is done by the Bucyrus-Erie 30B electric crane which also loads the hopper. Thus, the mixing plant requires the services of only one man for the crane and an attendant for the mixer, except in wet weather, when it is sometimes necessary to place a man on the sand-clay hopper to insure a steady feed. The mixing plant is powered by a 30-hp. General Electric electric motor, which operates the plate feeder, the calcium-chloride meter feed, and the pug-mill.

The unit of the plant built on the bank consists principally of a vibrating screen, grizzly and hopper. The screen is 3 ft. by 6 ft. in size, has 1-in. openings, is set on an incline, and is powered by a 3-hp. General Electric motor. Above the screen is a grizzly constructed of rails, which prevents the weight of the soil from being placed on the screen and removes the larger stones and clumps of sod. The success of this unit of the plant is due largely to the nature of the overburden at the company's pit. While the strippings contain enough clay to provide a mixture meeting the stabilization specifications, the deposit also contains sand and some stone, and the resulting mixture is easily pulverized. Except after very heavy rains, the overburden is thoroughly broken up by the action of the screen and grizzly, and only about 25 per cent. of the overburden is waste, consisting of stone and sod. The screening plant is fed directly from the bank by an Osgood ¾-cu.yd. steam shovel.

Before the plant was built soils tests were made of the overburden and pea gravel by a soils engineer and the approximate combination of the soils needed was computed. When these tests revealed the presence of sufficient clay in the overburden to produce a suitable mixture, Mr. Slater proceeded with the design and construction. The plant can be set to produce a mixture having any desired plasticity index by adjusting the flow from the hopper. Little difficulty has been encountered in operation since production was started. From the mixing plant the stabilized material is hauled to the road and placed in a windrow, ready to be spread by the blade, shaped and compacted.

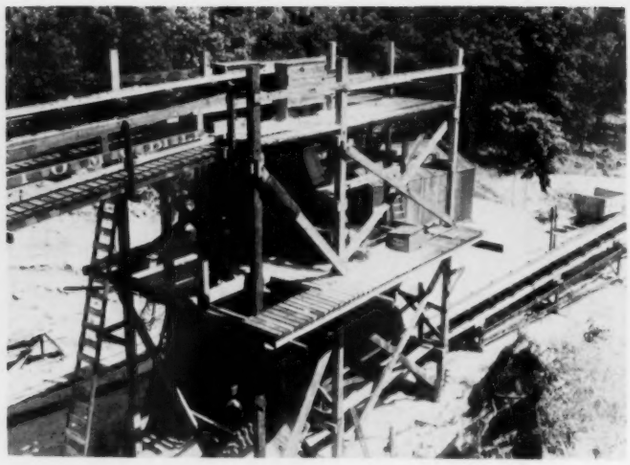
Plant production of this material offers several advantages both for the highway engineer and for the producer, Mr. Slater believes. For the highway engineer the plant production provides a more uniform mix than can be obtained by road-mixing methods. There is also less dependence on weather conditions and less interference with traffic. For the gravel plant operator production of the stabilized mix offers a new market for his products and a means of utilizing much of the overburden which is otherwise waste material.

Production of Gypsum Rises

The output and sales of gypsum and gypsum products were substantially larger for most items in the second quarter of 1935 than in the corresponding quarter of 1934, according to returns of the quarterly canvass of the gypsum industry by the United States Bureau of Mines.

Crude gypsum and gypsite mined in the second quarter of 1935 totaled 523,238 short tons, compared with 439,953 tons in the second quarter of 1934, an increase of 18.9 per cent. Imports as reported by 10 importers showed a 10.4-per cent. gain. Sales of uncalcined gypsum and gypsite of domestic and foreign origin increased 8.8 per cent., and the output of calcined gypsum made from domestic and imported material was 19.2 per cent. greater in the April-June quarter, 1935, than in the same period in 1934. Of the calcined gypsum products only wall board and partition tile showed losses, 2.9 per cent. and 8.9 per cent. respectively.

Two hundred and ninety foot conveyor from receiving hopper to plant.



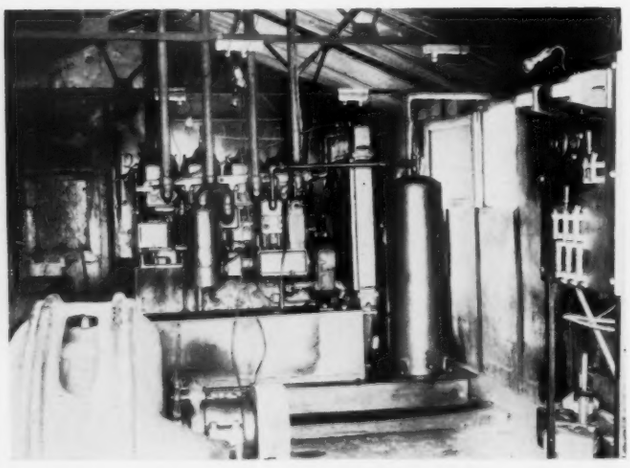
Screening plant with bar grizzly, two vibrating screens and double-roll crusher.

Silica Sand Plant *(from page 31)*

roll crusher, driven by a 20-hp. Allis-Chalmers motor, and is fed to the S-A belt-conveyor. This conveyor, 80 ft. long, carries the product from the screening plant to the loading platform above the railroad siding. A bifurcated discharge spout with cut-off valves allows continuous loading without a shut-down between cars.

The plant, located a mile or more from any electric-power line, provides its own supply. Electricity for the screening plant and conveyor motors is generated by a 4-cyl., 75-hp., Atlas Imperial Diesel engine driving a General Electric, 75-kv.-a, 440-v., 3-phase, 60-cycle generator, rated at 98 amp. A small 3-kw., 125-v. Northern generator, also driven by the Diesel engine, is used to excite the armature of the big generator and to furnish electric lights for night operation. The water pump and dragline are operated by gasoline power, although it is planned to add a second Diesel-generator unit.

Water for drilling and other purposes is taken from a near creek by a Gould, 3-plunger, 3-in. by 4-in. pump, driven by a 6-hp. International stationary engine. Cutler-Hammer switches and controls are used throughout.



Diesel-electric plant which generates power for all the equipment except hoist.

Stephens-Adamson engineers designed the plant to run 24 hr. a day in three shifts whenever the demand requires. This company furnished the crusher and conveying equipment. A 10-hp. Allis-Chalmers motor drives the 290-ft. conveyor and a 7½-hp. Allis-Chalmers motor is used for the 80-ft. conveyor, both conveyors being equipped with Simplex carriers in which Timken tapered roller-bearings are used.

The sand is shipped by railway to steel foundries in Ohio, Michigan, Indiana, Illinois, Iowa, Missouri, Wisconsin, and as far as Canada and the Pacific coast. George M. Pendergast & Co., with general offices in Milwaukee, Wis., also operate producing plants for other grades of foundry sand in Wisconsin.

Stone Industries in 1934

Crushed and broken stone, which includes stone for concrete and road metal, railroad ballast, roadbase, riprap, agricultural limestone, refractory stone, metallurgical stone (fluxing stone) and for various chemical and manufacturing processes, amounted to 90,706,620 short tons valued at $82,203,047 in 1934, an increase of 32 per cent. in quantity and 40 per cent in value. Crushed stone aggregates for concrete and road metal amounted to 55,244,470 short tons valued at $52,471,430, an increase of 35 per cent. in quantity and 46 per cent. in value over 1933. Of this 43,259,180 tons (71 per cent.) was produced by operators of commercial quarries and 17,308,740 tons (29 per cent.) by noncommercial operators. The commercial production increased 14 per cent. in 1934 over 1933, and the noncommercial output in 1934 was nearly 2¼ times that of 1933. The total average value a ton in 1934 was 95 c.; in 1933, 88 c. The stone crushed for railroad ballast amounted to 5,323,450 tons valued at $3,995,177, an increase of 15 per cent. in quantity and 26 per cent. in value. The average value per ton in 1934 was 75 c.; in 1933, 69 c. Of the other principal crushed and broken stone products fluxing stone increased in output in 1934 16 per cent.; riprap, 86 per cent.

MEN OF THE INDUSTRY

E. J. SIMONS

E. J. SIMONS, president of the Washington-Idaho Lime Products Co., Spokane, Wash., went west in 1899 to participate in the construction and development of the Conroy Placer Mining Co. property at Virginia City, Mont. Later he went to Butte to join the organization of F. Augusta Hinsey as master mechanic. After several years he moved to Spokane, where he formed the General Machinery Co. in 1906. The Idaho Portland Cement Co. at Inkom was organized by him in 1928. His present operating company, the Washington-Idaho Lime Products Co., has just begun the operation of a new cement plant erected on the property once owned by the Orofino Portland Cement Co., which in 1913 began, but never completed, the construction of a plant at Orofino.

Personal Mention

Chas. F. Conn, president of Giant Portland Cement Co., Philadelphia, Pa., is one of a group of business men appointed by the United States Chamber of Commerce to serve on a committee to study railroad consolidations.

Roy A. Schweiger, Kansas City, Mo., who formerly was associated with the Consolidated Cement Corp. of Fredonia, Kan., and Chicago, has been made purchasing agent for the Trinity Portland Cement Co., Dallas, Tex.

Lewis E. Sickles, foreman at the Hudson, N. Y., plant of the Universal Atlas Cement Co., was presented with a 25-yr. silver medal on Aug. 22 by Supt. Richard A. Dittmar.

George Gauntlett, manager of the Pioneer Sand & Gravel Co. of Seattle for the past several years, will return to Aberdeen, Wash., to assume management of the Grays Harbor Construction Co. and Building Materials, Inc.

Dr. O. L. Seubaugh has been appointed plant physician for the Cape Girardeau, Mo., plant of the Marquette Cement Mfg. Co. to succeed the late Dr. Paul R. Williams, who had served for 12 years.

G. S. Brown, chairman of the Alpha Portland Cement Co. board, Easton, Pa., has been elected vice-president of the First National Bank & Trust Co.

J. S. Schirm Co., San Diego, Cal., announces that, due to recent expansion of the Holmes Lime & Cement Co., **E. B. MacNab,** vice-president, and **Mr. Stephens,** are being transferred to San Francisco, the former as manager of the northern company, continuing as vice-president of the J. S. Schirm Co., and the latter as sales manager of the Holmes Lime & Cement Co. **W. W. Wheatly** remains in San Diego as general manager in charge of operations of the Schirm company, with **Crandall M. Covert** and **George E. Scheffler** as assistants in the Sales Department.

W. W. Spangler, who has been with the Westinghouse Electric & Manufacturing Co., since 1916 as treasurer and accounting representative at the Seattle, Wash., office, has been appointed credit manager of the company with offices in East Pittsburgh, Pa.

F. M. Thorman, Quality Supervisor of the United States Gypsum Co., Oakfield, N. Y., addressed the annual meeting of the Ceramic Assn., of New York, June 7th, at the New York State College of Ceramics, Alfred, N. Y., on the subject of "Quality Control."

John G. Barry, senior vice president of the General Electric Co., Schenectady, N. Y., has retired after more than 45 years' service with the company. He was elected to an honorary vice presidency of the company.

O. R. Lane has been appointed representative of the Kennedy Valve Mfg. Co., in Oklahoma, Arkansas, Eastern Missouri, Southern Illinois, and Indiana, with offices at 455 Paul Brown Bldg., St. Louis, Mo.

A. H. Hinkle, former PWA state engineer in Indiana, has been appointed executive director of the Kentucky Rock Asphalt Institute, recently organized by rock-asphalt producing companies of Kentucky. Research engineer for the Kentucky Rock Asphalt Co. at present, Mr. Hinkle has also served as deputy highway commissioner of Ohio and as superintendent of the Indiana State Highway Commission.

Obituary

William L. Sporborg, 65, who passed away on Sept. 1, was born in Gloversville, N. Y. in 1870, spending his early years in the glove business. In 1904 he became general manager of the Rock Cut Stone Co., acquiring ownership after an interval of 10 years, and having in the meantime become associated with A. G. Seitz. In 1929, when the Rock Cut Stone Co. merged with the General Crushed Stone Co., Mr. Sporborg became a member of the Board of Directors. Mr. Sporborg was one of the founders of the National Crushed Stone Assn., being one of its most loyal and faithful supporters, and serving on its Board of Directors and Executive Committee for many yaers. He was also one of the organizers of the New York Crushed Stone Assn., and served for several years as President.

Mr. Sporborg was well known throughout the crushed-stone industry and enjoyed an excellent reputation in the civic life of Syracuse. His marriage to Miss Flora M. Bostwick took place on July 12, 1912 and Mrs. Sporborg and one daughter, Flora Agnes, survive him.

William W. Hamilton, safety director of the Alpha Portland Cement Co. since 1929, passed away at Cincinnati on Aug. 27. He was a leading figure in the safety work of the cement industry and had been an active member of the Committee on Accident Prevention and Insurance of the Portland Cement Assn. for a number of years. Prior to heading the safety and welfare work of the Alpha company he had been chief engineer and safety director of the Alpha cement plant at Ironton, O., since the close of the World War. While at Ironton Mr. Hamilton built up the safety work of the plant there to a point where it won country-wide recognition.

R. C. Brown, for many years vice-president of the Western Lime & Cement Co., Milwaukee, Wis., died in Oshkosh on September 10. For a long time he had been a director of the National Lime Assn., representing District 8.

C. C. Hall, mineral wool manufacturer of Alexandria, Ind., died recently.

Henry M. Poole, 64, Des Moines, Ia., passed away on Aug. 25. At the time of his death Mr. Poole was president of the Flint Crushed Gravel Co., Iowa Limestone Co., and Standard Gravel Co., all of Des Moines.

Arthur F. Williams, 55, president of the Williams Patent Crusher & Pulverizer Co., St. Louis, Mo., died on Aug. 21, following an illness of about 18 months. For 12 years he had been president of the company founded by his father, Milton F. Williams, 38 years ago. Mr. Williams served as vice-president prior to the death of his father.

Coming Events

October 3-4, 1935. San Francisco, Cal. Regional Meeting, American Institute of Mining & Metallurgical Engineers at the Palace Hotel.

October 14-18, 1935, Louisville, Ky. — 24th Annual Safety Congress, National Safety Council, Inc.

October 16-19, 1935, Chicago, Ill. —Convention of American County Assn. at Hotel LaSalle.

December 2-7, 1935, New York, N. Y.—Exposition of Chemical Industries.

December 5 and 6, 1935, Washington, D. C.—Fifteenth annual meeting of the Highway Research Board of the National Research Council. Roy W. Crum, director, 2101 Constitution Av., Washington, D. C.

December 9-12, 1935, Miami, Fla. —Annual convention, American Assn. of State Highway Officials.

January 18-24, 1936. Cleveland, O. Annual Road Show, American Road Builders' Assn. at the Exhibition Hall.

January 27-30, 1936. St. Louis, Mo. Concurrent annual conventions of the National Crushed Stone Assn., the National Sand & Gravel Assn. and the National Slag Assn. at Hotel Jefferson.

February 25-28, 1936, Wichita, Kans.—Ninth Annual Southwest Road Show and School, Exposition Bldg.

NEW CORPORATIONS

MASSAC MOULDING SAND CO., Paducah, Ky. Capital, $5,000. Incorporators, W. R. Bell, J. R. Wilkerson and J. S. Wilkerson.

MIDDLE CREEK SAND & LIMESTONE CO., Chattanooga, Tenn. Capital stock, 2,000 shares n.p.v.

MORROW COUNTY SAND & GRAVEL CO., Fulton, O. Capital, 250 shares. Incorporators, Edw. S. Griffiths, Clark R. Davis and Herman V. Irey.

NAPA DECORATIVE ROCK QUARRIES LTD., Napa, Cal. Capital, 800 shares of stock with par value of $25 per share. Incorporators, G. Von Uhlit, Carlo Cicero and Antionetta Cicero.

THE ROMAN GYPSUM & CEMENT CORP., Reno, Nev. Capital, $100,000. Incorporators, Edward Adelseck, Homer Brunell and George S. Green.

VOLZ GRANITE CO., Ableman, Wis. Capital, 250 shares, $100 per share. Incorporators, G. H. Volz, F. C. Wyckoff and H. E. Lueck. To quarry and crush stone and gravel.

THE WESTERN ROCK PRODUCTS CO., Inc., Los Angeles, Cal. Incorporators, R. Cetto, T. Burke and D. Richmond, all of Los Angeles.

THE WEST FARMINGTON WASHED GRAVEL CO., Detroit, Mich. Capital, $20,000, of which $6,200 has been paid in.

THE RANSOM SAND & GRAVEL CO., Eugene, Ore. Capital $5,000. Incorporators are R. Ransom, Bernice Hendrickson, and Walter M. Ransom.

THE RED RIVER SAND & GRAVEL CO., Oklahoma City, Okla. Capital stock $25,000. Incorporators are Moore C. Hess and A. E. Perry.

Foreign Developments

Wang Method Used in Slag Hydration Study

A detailed study of the reactions between blast-furnace slag and water was made by means of the method developed by T. Wang for studies of cement, in which in place of finely ground cement fine particles of slag of 88 to 120 were caused to react by shaking with water or hydrous solutions and the new formations were separated from the original material by decantation.

It was found that, in agreement with experiences in practice, the action of pure water causes neither a swelling of the slag particles nor an appreciable formation of new compounds, while so-called exciter solutions release vigorous reactions. The "alkaline" excitation is based on the combination of calcium hydroxide, and the "sulfate" excitation on the combination of calcium sulfate with the slag. The excitation affects principally the aluminates of the slag. The alkaline excitation causes the formation of high-basic calcium aluminate hydrates, the sulfate excitation the formation of calcium aluminate sulfate hydrate. This finding agrees with the practical experience that slags with too low alumina content have only weak hydraulic properties.

The hydration of the silicates brings about the formation of calcium silicate hydrates with a molar lime-silica quotient of 1.0 to 1.5. Even in the presence of alkaline exciters the concentration of calcium hydroxide in the fluid phase is very low in comparison with Portland cement, in which saturated lime water always occurs; the reason for this is to be sought in the combination of lime by the slag and in the action of varying amounts of sulfide.

Calcium sulfide is favorable to the hydration process mainly in that in its hydrolysis there are formed calcium hydrosulfide and also calcium hydroxide, which is an exciter. Elemental sulfur, which was found in the slag, reacts with the calcium sulfide in solution, forming calcium polysulfide, and with the dissolved calcium hydroxide, forming thiosulfate; the polysulfide also converts to thiosulfate; these reactions consume lime and consequently restrict the progress of the hydration.

In the series of tests conducted, the reactions of the hydration process went on in a certain "rhythm"; first there was a lively reaction and a coat of gel formed around the slag particle, gradually slowing down the reaction until, on reaching a certain thickness, the coat was mechanically split off and the surface bared for further surface reaction.

If sufficient amounts of lime are available, the same hydrated silicates and aluminates of calcium are formed in the hydration of slag in the presence of an alkaline exciter as in the hydration of Portland cement.—Dr. Friedrich Kaempfe in *Zement* 24:257-262, 272-275, 317-321, 335-339, 381-385, 398-400; April 25, May 2, 23, 30, June 20 and 27, 1935.

Hydraulic Property of Slag Is Investigated

The analogy of the difference between slag rapidly cooled in water and that slowly cooled in air to the difference between ordinary clinker and the occasional clinker from a shaft kiln which crumbles on cooling supports the conclusion that slag cooled in air, which is feebly hydraulic, contains B dicalcium silicate, the only hydraulic silicate in slags.

Slag whether granulated or not has a certain hydraulicity, and the addition of a very small quantity of hydrated lime accelerates the hydraulic activity. This accelerating action of even a very small quantity of lime can scarcely be due to any combination with the silica gel. Furthermore, anhydrous or more or less hydrated calcium sulfate, as well as a mixture of hydrated lime and calcium sulfate, have the same activating effect as the hydrate of lime. Further studies on the hydraulicity of slag are in progress.—E. Leduc in *Revue des Materiaux de Construction et de Travaux Publics*, No. 310, July, 1935, pp. 161-165.

Slag Similar to Cement Is Made in Test Furnace

In connection with some experiments on the operation of a blast furnace by adding oxygen to the forced air, the Gutehoffnunghütte (Good Hope Furnace) in Germany built a special experimental furnace and, among other things, experimented with the production of a slag similar in composition to Portland cement—that is, with increased content of limestone. This was found to be an actual possibility when the air is enriched with oxygen to the extent of 25 to 30 per cent., and the air blast preheated to 750 to 800 deg. C. The high-calcium slag, ordinarily difficult to fuse, passed through the furnace smoothly and without destruction of the furnace lining. It was also discovered that in the case of this high-calcium slag a smooth operation without destruction of the lining depended on the condition that the proportion of slag to raw iron should not exceed 750 kg. per ton.

On the basis of tests made on the cement produced it was concluded in general that about the same principles obtain in the development of the necessary practical properties of cement so produced as in the case of sintered Portland cement. Some of the slags attained strengths equal to those of good German high-test standard cements. With a suitable chemical composition, a furnace operation freed from the difficulties of experimental operation and with the elimination of certain components harmful to cement strength, especially carbide, the strengths for smolten cement slags ought to be considerably increased. Of the problems still to be solved in connection with the production of a marketable high-test Portland cement in the blast furnace, two are preeminent: the complete elimination of calcium carbide in the full-size operation, and regulation of the setting time.—G. Mussgnug in *Zement*, 24:485-490, 503-507, August 8 and 15, 1935.

Hydrochloric Acid as Strength Accelerator

On the basis of tests on the use of calcium chloride and hydrochloride acid in construction work the author concludes that such admixtures increase the strength of concrete not only during the first few days but even after the first 28 days. This effect is especially strong in connection with puzzuolan-Portland cement. Also, the density, impermeability, chemical resistance and, under certain conditions, the constancy of volume of concrete mixes are improved. It was further observed that the electrical conductivity of the concrete is diminished, so that the necessary tension in the electrical heating of concrete can be lowered. The use of hydrochloride acid in place of calcium chloride is to be preferred in that the use of the material is not so great and the favorable action on the strength at times is greater. In the working of old cements the hydrochloric acid destroys the inactive granular surfaces, which is not true in the case of calcium chloride.—Prof. B. Skramtajew in *Der Bautenschutz*, 1935, No. 7, pp. 85-88; *Tonindustrie-Zeitung* 59:737, July 29, 1935.

Rock-Asphalt Producers of Kentucky Organize

The Kentucky Rock Asphalt Institute, with offices in the Marion E. Taylor Bldg., Louisville, Ky., was recently organized. George Rapp, vice-president of the Ohio Valley Rock Asphalt Co., has been elected president. Other officers are Walter Areta, vice-president; W. N. Bosler, secretary-treasurer; and Rodman Wiley, Phil McGovern and G. C. Appleton, directors. A. H. Hinkle is executive director.

Aggregates Statistics *

Sand-and-Gravel Output Higher.—The total sand and gravel reported as sold or used by 1,925 commercial producers in the United States in 1934 amounted to 75,322,909 short tons valued at $48,364,767, an increase of 13.9 per cent in quantity and 6.7 per cent in average value per ton compared with 1933. In addition the production of sand and gravel from about 400 state, county, and municipal operations was reported to the Bureau of Mines. This material totaled 41,288,780 short tons valued at $12,882,406, decreases of 0.9 per cent in tonnage and 6.1 per cent in average value per ton compared with 1933. The total output of sand and gravel accounted for in the canvass by the Bureau of Mines was therefore 116,611,689 short tons valued at $61,247,173.

Production by commercial operations was virtually identical with the preliminary figure released early in 1934. The output of noncommercial operations, however, was greater than preliminary data indicated, and, as a result, the total production for the year exceeded the preliminary figure by 3 per cent.

Noncommercial Production. — Although a smaller number of schedules were returned from noncommercial operations in 1934 than in 1933, the output of this material was about the same in the two years. The decline in the number of returns was due in part to a trend toward consolidating individual county reports with state reports.

As in previous years only a small part (23 per cent in 1934) of the sand and gravel produced by noncommercial operations in 1934 was washed, screened, or otherwise prepared to make it comparable in quality with the output of the average commercial plant. By far the larger part consisted of pit-run material having a low unit value.

* By H. H. Hughes, A. T. Coons and M. Allan, U. S. Bureau of Mines.

SAND AND GRAVEL SOLD OR USED BY PRODUCERS IN THE UNITED STATES, 1933-34, BY COMMERCIAL AND NONCOMMERCIAL OPERATIONS AND BY USES

	1933			1934				
	Quantity (*short tons*)	Value		Quantity (*short tons*)	Value		Percentage of Change in—	
		Total	Average		Total	Average	Tonnage	Average Value
COMMERCIAL OPERATIONS								
Sand:								
Glass	1,781,423	$3,011,023	$1.69	1,923,614	$3,326,538	$1.73	+8.0	+2.4
Molding[1]	1,718,251	1,558,738	.91	2,167,731	2,169,254	1.00	+26.2	+9.9
Building[1]	13,024,174	6,496,180	.50	14,534,565	8,128,703	.56	+11.6	+12.0
Paving	10,903,447	5,544,368	.51	12,476,833	7,095,816	.57	+14.4	+11.8
Grinding and polishing	572,735	739,222	1.29	571,191	1,039,614	1.82	−0.3	+41.1
Fire or furnace[1]	106,133	121,149	1.14	137,000	169,424	1.24	+29.0	+8.8
Engine[1]	1,051,695	623,285	.59	1,211,033	795,648	.66	+15.2	+11.9
Filter	24,387	52,186	2.14	35,750	85,567	2.39	+46.6	+11.7
Railroad ballast[2]	721,381	193,153	.27	603,380	166,918	.27	−15.8	
Other[1]	1,121,271	502,036	.45	959,217	620,512	.65	−14.5	+44.4
Total sand	31,024,897	18,841,340	.61	34,624,314	23,597,994	.68	+11.6	+11.5
Gravel:								
Building	11,934,080	8,084,995	.68	14,244,016	9,834,381	.69	+19.4	+1.5
Paving	17,719,859	10,403,150	.59	19,276,791	12,654,884	.66	+8.8	+11.9
Railroad ballast[3]	4,928,031	1,777,163	.36	6,422,166	1,873,563	.29	+30.3	−19.4
Other[4]	499,605	288,379	.58	755,622	403,945	.53	+51.2	−8.6
Total gravel	35,081,575	20,553,687	.59	40,698,595	24,766,773	.61	+16.0	+3.4
Total sand and gravel	66,106,472	39,395,027	.60	75,322,909	48,364,767	.64	+13.9	+6.7
NONCOMMERCIAL OPERATIONS[5]								
Sand:								
Building	163,257	84,131	.52	334,946	213,304	.64	+105.2	+23.1
Paving	1,972,692	751,201	.38	3,440,830	1,069,773	.31	+74.4	−18.4
Total sand	2,135,949	835,332	.39	3,775,776	1,283,077	.34	+76.8	−12.8
Gravel:								
Building	650,873	253,529	.39	655,914	441,838	.67	+0.8	+71.8
Paving	38,862,055	12,589,022	.32	36,857,090	11,157,491	.30	−5.2	−6.2
Total gravel	39,512,928	12,842,551	.33	37,513,004	11,599,329	.31	−5.1	−6.1
Total sand and gravel	41,648,877	13,677,883	.33	41,288,780	12,882,406	.31	−0.9	−6.1
COMMERCIAL AND NONCOMMERCIAL OPERATIONS								
Sand	33,160,846	19,676,672	.59	38,400,090	24,881,071	.65	+15.8	+10.2
Gravel	74,594,503	33,396,238	.45	78,211,599	36,366,102	.46	+4.8	+2.2
Grand Total	107,755,349	53,072,910	.49	116,611,689	61,247,173	.53	+8.2	+8.2

[1] To avoid disclosing confidential figures for 1933, small amounts of molding, engine, and fire or furnace sands are included with building and "other" sands.

[2] Includes some sand used for fills and similar purposes. The quantity of sand reported as used exclusively for railroad ballast amounted in 1933 to 550,948 tons (revised figures) valued at $160,576, and in 1934 to 426,129 tons valued at $138,459. The figures include sand produced by railroads for their own use as follows: 1933, ballast, 50,811 tons valued at $7,694; fills and similar purposes, 170,433 tons valued at $32,577; 1934, ballast, 59,164 tons valued at $8,194; fills and similar purposes 181,251 tons valued at $28,459.

[3] Includes some gravel used for fills and similar purposes. The quantity of gravel reported as used exclusively for railroad ballast amounted in 1933 to 4,668,597 tons valued at $1,747,452, and in 1934 to 5,664,587 tons valued at $1,804,991. The figures include gravel produced by railroads for their own use as follows: 1933, ballast, 1,232,795 tons valued at $247,522; fills and similar purposes, 259,434 tons valued at $29,711; 1934, ballast, 2,205,513 tons valued at $321,892; fills and similar purposes, 757,579 tons valued at $68,572.

[4] May include some gravel used by railroads for fills and miscellaneous purposes.

[5] By states, counties, municipalities, and other Government agencies, directly or under lease.

CRUSHED STONE SOLD OR USED BY COMMERCIAL AND NONCOMMERCIAL OPERATORS IN THE UNITED STATES, 1930-34[1]

Year	Commercial Operations			Noncommercial Operations[2]			Total	
	Quantity (*short tons*)	Change from Previous Year (*percent.*)	Percentage of Total	Quantity (*short tons*)	Change from Previous Year (*percent.*)	Percentage of Total	Quantity (*short tons*)	Change from Previous Year (*percent.*)
1930	79,560,890	−6.8	91.3	7,550,000	+3.3	8.7	87,110,890	−6.1
1931	64,818,410	−18.5	89.3	7,806,000	+3.4	10.7	72,624,410	−16.6
1932	43,284,190	−33.2	83.2	8,710,910	+11.6	16.8	51,995,100	−28.4
1933[3]	37,839,200	−12.6	83.2	7,651,410	−12.2	16.8	45,490,610	−12.5
1934[3]	43,259,180	+14.3	71.4	17,308,740	+126.2	28.6	60,567,920	+33.1

[1] Includes stone for concrete and road metal and railroad ballast. Figures for "noncommercial operations" represent tonnages reported by states, counties, municipalities, and other Government agencies, produced either by themselves or by contractors expressly for their consumption, often with publicly owned equipment; they do not include purchases from commercial producers. Figures for "commercial operations" represent tonnages reported by all other producers.

[2] Includes 8,530,220 short tons valued at $0.92 a ton produced directly by construction and maintenance crews of states, counties, municipalities, and other Government agencies and 8,778,520 short tons valued at $0.91 a ton produced by contractors expressly for these agencies.

[3] 1933: Average value per ton of commercial stone, $0.84; noncommercial stone, $0.95.
1934: Average value per ton of commercial stone, $0.94; noncommercial stone, $0.91.

Additional data regarding the output of noncommercial operations were collected for the year 1934. Noncommercial production included 20,314,296 short tons valued at $0.22 a ton, produced directly by the construction and maintenance crews of states, counties, municipalities, and other government agencies, and 20,974,484 tons valued at $0.40 a ton, produced by contractors expressly for the use of these agencies. Furthermore, 68 per cent of the total was reported by state highway officials, 28 per cent by counties, 1 per cent by municipalities, and 3 per cent by other agencies.

Crushed Stone.—The production of crushed stone for concrete and road metal increased from 40,857,120 short

PRODUCTION OF CRUSHED AND BROKEN STONE SOLD OR USED BY PRODUCERS IN THE UNITED STATES, 1933-34, BY PRINCIPAL USES

	1933			1934			Percentage of Change in—	
	Quantity (*short tons*)	Value		Quantity (*short tons*)	Value			
		Total	Average		Total	Average	Short Tonnage	Average Value
Concrete and road metal	40,857,120	$35,843,318	$0.88	55,244,470	$52,471,430	$0.95	+35.2	+8.0
Railroad ballast	4,633,490	3,175,418	.69	5,323,450	3,995,177	.75	+14.9	+8.7
Metallurgical	7,984,710	5,512,533	.69	9,230,880	6,297,579	.68	+15.6	−1.4
Alkali works	4,193,650	2,120,908	.51	3,814,060	2,015,506	.53	−9.1	+3.9
Riprap	3,254,860	3,486,155	1.07	6,052,970	5,894,259	.97	+86.0	−9.3
Agricultural limestone	994,540	1,239,724	1.25	1,612,380	1,788,142	1.11	+62.1	−11.2
Refractory (ganister, mica schist, dolomite, soapstone)	501,440	710,526	1.42	677,410	863,078	1.27	+35.1	−10.6
Asphalt filler	126,780	332,159	2.62	172,170	361,404	2.10	+35.8	−19.8
Calcium carbide	117,740	75,077	.64	305,600	177,458	.58	+159.6	−9.4
Sugar factories	607,990	887,630	1.46	479,900	658,502	1.37	−21.1	−6.2
Glass factories	199,720	245,835	1.23	161,220	260,410	1.62	−19.3	+31.7
Paper mills	196,440	285,850	1.46	262,160	408,022	1.56	+33.5	+6.8
Other uses	5,246,020	4,846,515	.92	7,369,950	7,012,080	.95	+40.5	+3.3
Total	68,914,500	58,761,648	.85	90,706,620	82,203,047	.91	+31.6	+7.1
Portland and natural cement (including "cement rock")[1]	16,117,000			19,730,000			+22.4	
Lime [2]	4,450,000			4,800,000			+7.9	
Total stone	89,481,500			115,236,620			+28.8	
Asphaltic stone	285,070	1,125,164	3.95	410,453	1,762,376	4.29	+44.0	+8.6
Slate granules and flour	186,380	1,180,322	6.33	166,160	1,066,100	6.42	−10.8	+1.4

[1] Value reported as cement in the chapter on cement.
[2] Value reported as lime in the chapter on lime.

tons in 1933 to 55,244,470 tons in 1934, and that of railroad ballast from 4,633,490 tons in 1933 to 5,323,450 tons in 1934, advances of 35 and 15 per cent, respectively. The average value per ton also increased in 1934.

Noncommercial production amounted to 17,308,740 short tons, more than double that reported in 1933. Of this quantity about half was produced directly by states, counties, municipalities, and other government agencies, and the other half by contractors expressly for these agencies.

Truck Mixer Manufacturers Get Powell Patent License

The Powell Co., Philadelphia, Pa., owner of the Powell process patents, announces that it has negotiated with the Blaw-Knox Co., Chain Belt Co., Jaeger Machine Co., and Ransome Concrete Machinery Co. to provide all past and future users of their bodies with full protection under the Powell process patents. To secure this protection it is necessary for future buyers of equipment from these four companies correctly to declare the use to which such bodies will be applied.

Concrete bodies made and sold heretofore and hereafter by other firms than the four noted are not protected by the Powell process patents, and operators of such bodies are subject to possible suit by the Powell Co. The latter states it is willing to consider reasonable terms of settlement to protect operators of such other equipment from infringement suits by Powell, if the purchase has been made prior to Jan. 1, 1935, and if the equipment has been or is being used in the dual-mix process, i.e., transporting central-mixed concrete.

Harry S. Brown Is Made President of Foster Wheeler

The Foster Wheeler Corp., New York, N. Y., announces the election of Harry S. Brown as president. Mr. Brown, who joined the Power Specialty Co. in 1904, served in its engineering and sales departments for 15 years, resigning to accept the position of vice-president of Wheeler Condenser & Engr. Co. In 1927 these two companies consolidated to form the Foster Wheeler Corp., with Mr. Brown as a director and vice-president in charge of sales. J. J. Brown, a brother, formerly president of the Foster Wheeler Corp., continues actively as chairman of the board. David McCulloch, who was secretary and general manager, is now executive vice-president and Walter F. Keenan, Jr., George B. Ferrier and J. J. Nelis are vice-presidents and P. N. Wenz as secretary.

Federal Court Upholds 3-Way Hydraulic Dump-Truck Patents

The Commercial Shearing & Stamping Co., Youngstown, O., which holds patents on a 3-way hydraulic dumping system for truck bodies, announces that its patents were recently held valid in a federal court decision. The company brought suit against Gar Wood Industries, Inc., of Detroit, Mich., and also against Dutchess County, N. Y., for infringement of patent; verdicts favorable to the Commercial company were given, in consent decrees, in each case. Suits to test the patent validity were instituted by the company in federal courts in Michigan and New York.

The company's 3-way dump truck bodies are so equipped that they may dump either to the rear, or the right or left, as need requires. The Commercial company manufactures a variety of steel truck bodies, with patented hydraulic hoist. This equipment is manufactured for the light truck field, as well as for the heavier types of motor truck.

Chain Belt Appoints New Distributors in Maine

The Eastern Tractor & Equipment Co., whose main office is located at 315 Forest Ave., Portland, Me., with a branch at 632 Maine St., Bangor, Me., has been appointed by the Chain Belt Co., Milwaukee, Wis., as its exclusive distributor for the state of Maine. This company was organized in 1933 by Mr. C. R. Obrion, formerly with the Caterpillar Tractor Co., and associated with the construction industry for a number of years. Parts stocks and service departments are maintained at both points.

The Philadelphia sales office of the Ajax Flexible Coupling Co. has been moved to 1108 Otis Bldg. V. L. Sanderson is the representative in charge.

Fuller Company Acquires Fluxo Pump-Making Rights

The Fuller Co. of Catasauqua, Pa., has acquired the exclusive rights to the Fluxo system for conveying cement and other pulverized materials, in the United States and possessions, Canada and Mexico, from F. L. Smidth & Co., New York.

American Optical Obtains Interest in Spencer Lens

The Spencer Lens Co., Buffalo, N. Y., announces that negotiations have been completed whereby the American Optical Co. has acquired a substantial interest. H. N. Ott, president of the Spencer company, states that with the American Optical firm's one hundred years of experience and success in its field to guide and assist, the S. encer concern will be able to progress even more rapidly through enlarged manufacturing resources and new and important development work. The business will continue under the name of the Spencer Lens Co., with the same policies and personnel, and with executive offices and manufacturing plant at Buffalo, as at present.

Harnischfeger Appoints Frank Liebich Detroit Area Manager

The Harnischfeger Corp. of Milwaukee announces the appointment of Frank Liebich as district manager in charge of the company's operations in the Detroit area. Mr. Liebich, who moves to Detroit from the corporation's Chicago office, will have charge of the complete line of products, including excavators, cranes, welders, hoists, motors, lighting plants and brewery equipment. Since entering the Harnischfeger Industrial Sales Division in 1924 Mr. Liebich has handled several of the country's largest installations of overhead traveling cranes.

Link-Belt Makes Changes in Boston, Philadelphia Forces

The Link-Belt Co., Philadelphia, Pa., announces the appointment of T. Frank Webster of the Link-Belt Philadelphia office, as resident manager of the Boston, Mass., office, succeeding Horace Goldstein, who has been assigned to engineering sales work in the Philadelphia office. Mr. Goldstein, who is well acquainted in the Philadelphia territory, was formerly associated with the New York office. Mr. Webster, prior to the Philadelphia connection, was resident manager at Pittsburgh.

Bucyrus-Erie Co. Announces Florida, Iowa Distributors

Bucyrus-Erie Co., South Milwaukee, Wis., announces the appointment of the Florida Machinery Corp., 2315 N. Miami Ave., Miami, Fla., as distributors for the Bucyrus-Erie machines ranging from ⅜ to 2 cu. yd. capacity—shovels, draglines, cranes, clamshells, dragshovels and skimmer scoops. The Bucyrus-Erie Co. also announces the appointment of the Haight Tractor and Equipment Co., 1214 Mulberry St., Des Moines, Ia., as distributors of the same equipment in the central and eastern portions of Iowa.

Kennedy Valve Firm Appoints Godbey to Kansas City Office

William Godbey, according to a recent announcement, has been appointed by the Kennedy Valve Mfg. Co., Elmira, N. Y., to represent this company in Kansas, Nebraska, western Missouri, and southwest Iowa. Mr. Godbey will handle the sales of Kennedy iron body and bronze valves, malleable-iron and bronze screwed fittings and cast-iron flanged fittings and flanges. His headquarters will be at Kansas City, Mo.

Eddy & Cuthbert, representatives in Michigan for the Productive Equipment Corp., are now located at 709 S. Washington Ave., Lansing.

Traffic News and Comment

Recent I. C. C. Decisions

Cement.—In the case of cement moving from Hannibal (Ilasco Junction), Mo., to Evansville, Ind., for movement on the Ohio River to Stanley, Ky., the Commission has found the rate unreasonable to the extent that it exceeded 11c., including an emergency charge of 1c. and has awarded reparation of $1,033.60. The applicable rate charge on shipments of 16c. includes an emergency charge of 1c. This shipment was used on dams and highways under construction at the time of the movement and as no further movement is contemplated the new rate was not prescribed for future use.—I. C. C. Docket No. 26,826, Universal Atlas Cement Co. *v.* Wabash *et al.*

Sand.—After a second hearing the Commission has awarded reparation due under findings in 188 I. C. C. 99 on silica sand moving from the Ottawa, Illinois District to Monroe, Mich., and Toledo, O., and has ordered the reparation to be paid not later than November 1.—I. C. C. Docket No. 17,822, River Raisin Paper Co. *v.* C. B. & Q. *et al.*

Slag.—The Commission has authorized carriers defendant in National Slag Co. *v.* Atlantic City Railway Co., 181 I. C. C. 699, in fourth-section application 14,1716, to establish and maintain rates on slag *via* circuitous routes from points in Pennsylvania to destinations in trunk-line and New England territory and between points in Pennsylvania *via* interstate routes, the same as those over direct routes subject to the usual 50- and 70-per cent. circuitous limitations.—I. C. C. F. S. O. No. 12,008, slag from Pennsylvania.

Examiners' Report

Sand.—Examiner John McChord proposes that the Commission award reparation on finding that the rates on silica sand, molding sand and blasting sand from Cape May, Cedarville and Manumuskin, N. J., to Irvington, N. Y., and from Cape May, N. J., Elmira and Ushers, N. Y., to Lana, Pa., are unreasonable to the extent that they exceed or exceeded $2.50 per ton when moving in open-top cars and $2.70 per ton when moving in closed cars. The rates from Stuyvesant and Usher, N. Y., to Elizabeth, N. J., were assailed in this case but the examiner recommends that the Commission find that the rate of $2.90 a net ton was not and is not unreasonable.—I. C. C. Docket 26,901, Burnaham Boiler Corp. *v.* C. of N. J.

New Complaints Filed

Sand.—Reparation is prayed for and unreasonable rates alleged on sand from points in Kentucky, Michigan and Ohio to Auburn, Ind., in I. C. C. Docket No. 27,118, Auburn Foundry, Inc., Auburn, Ind., *v.* C. & O. *et al.*

Alleging unreasonable rates on sand from Utica and Ottawa, Ill., to Springfield, O., reparation is sought in a complaint filed in I. C. C. Docket No. 27,121, Ohio Steel Foundry Co., Lima, O., *v.* C. B. & O. *et al.*

Silica Sand.—Charging that the rates on silica sand from Ottawa, Ill., to Cleveland, O., are unreasonable, reparation is asked for in a complaint in I. C. C. Docket No. 27,117, Cleveland Cooperative Stove Co., Cleveland, O. *v.* C. B. & Q. *et al.*

Motor-Carrier Regulation

Motor Carriers.—Motor carriers, the motor-truck division of the Commission and traffic men interested in motor-truck rates are just beginning to realize the enormity of the task confronting the carriers and the Commission in putting into effect the Motor Carrier Act passed by the last Congress. While there has been some delay owing to the failure of Congress to appropriate funds for the Commission on account of the filibuster conducted by Senator Huey Long, the Commission is rapidly whipping into shape an organization for administration of the act.

According to plans, there will be 16 districts in the United States, each of which will have a staff composed of a district representative who will be in charge, with one joint board representative, one rate examiner, one accountant, and a number of supervisors.

In order to make the motor carriers familiar with the requirements of the law and of the Commission's rules, the supervisors will contact the carriers and give them advice as to the filing of rates and accounting.

The 16 districts are: (1) Maine, New Hampshire, Vermont, Massachusetts and Rhode Island; (2) Connecticut, New York, New Jersey and Delaware; (3) Maryland, District of Columbia and Virginia; (4) Pennsylvania and West Virginia; (5) Ohio, Indiana and Kentucky; (6) North Carolina, South Carolina, Georgia and Florida; (7) Alabama, Tennessee, Mississippi and Arkansas; (8) Illinois, Michigan and Wisconsin; (9) Minnesota, North Dakota and South Dakota; (10) Iowa, Nebraska, Kansas and Missouri; (11) Oklahoma, Louisiana and Texas; (12) Montana and Idaho; (13) Washington and Oregon; (14) Wyoming, Colorado and Utah; (15) New Mexico and Arizona; and (16) Nevada and California.

On September 19 the Commission issued an order stating that the effective date of those parts of the act relative to the filing of tariffs, issuance of receipts or bills of lading and the collection of charges will be Dec. 1, 1935. The other provisions of the act are to become effective Oct. 1. This means that carriers and brokers who are subject to the act will have 120 days from October 1 in which to file applications for certificates of public convenience and necessity, permits and brokerage licenses. Any consolidations or mergers of truck lines made after Oct. 1 will be subject to the rules of the Commission, as will also be the issuance of securities.

The two months intervening before the publication of rates is necessary will not be any more than is sufficient to solve some of the problems connected with the publication of motor-truck rates.

There is a very divided difference of opinion among those interested in motor traffic as to the basis for rates and classification. Some contend that the Official Classification used by the railway carriers should be adopted by the truck operators with some exceptions as to the rules to make them conform to the needs of motor transportation. On the other hand, it is argued that the Official Classification is unnecessarily complicated and that a much simplier classification should be used for motor traffic.

There is some contention that motor rates should be related to railway rates with due regard for the additional service rendered on short hauls which might justify a rate higher than the railway rate for short hauls, with rates equal to the railway rates for certain distances and then rates higher than railway rates for longer distances. This plan encourages the use of trucks for comparatively short hauls and the use of the railways for long hauls.

Others argue that the truck rates should not necessarily bear any relationship to the railway rates, but that they should be made on the basis of the cost of performing the services plus a reasonable profit. Still others contend that the rates should be based entirely on the value of the service.

The number of plans being proposed for making classifications and rates is almost without number. One plan drawn up by a committee of the Chicago Traffic Council, which has a number of supporters, is known as the A B C Truck Rate Plan. This divides the classifications of merchandise into three groups. The first is a basic group designated as merchandise, not otherwise stated, and to be known as group B. Second, a restricted list of light-weight, bulky commodities to be known as group A. The third list is a restricted list of heavy-weight commodities of a density greater than the weight density of articles in group B to be known as group C.

Commodities requiring other than ordinary handling which would not be included in these three groups would receive special treatment under this plan, the density of commodities falling in various groups to be approximately less than 10 lb. per cu. ft. for group A, with those weighing from 10 to 30 lb. per cu. ft. falling in group B, and those weighing over 30 lb. per cu. ft. in group C. It is suggested that a rule be adopted providing a maximum valuation of $1 a lb. where no special notation is made on the bill of lading. When the value is declared to be greater than $5 a lb., it is suggested that there be an additional charge, much the same as is assessed by the Railway Express Co.

While sponsors of this plan do not approve the making of truck rates on a relationship to railway rates as a permanent policy, they suggest that to begin with commodities in group A should take 100 per cent. of the present first-class railway rates, with commodities in group B taking 70 per cent. and commodities in group C taking 50 per cent. This applies to less-than-truck-load traffic. Various minimum weights have been suggested for quantity ratings, such as 5,000, 7,500, 10,000, 15,000 and 20,000 lb. for single shipments on which special commodity rates would be published.

I. C. C. Practitioners

At the recent session of Congress Senator Wagner introduced Senate bill No. 2,944, prohibiting anyone other than lawyers from practicing before government departments, bureaus, commissions, and other agencies except for their direct principals. This bill was disapproved by the Senate Judiciary Committee and action on it was indefinitely postponed.

The Federal Bar Assn. of New York, New Jersey and Connecticut is now undertaking to have the lawyers press for passage of this legislation at the next session of Congress.

They have sent a copy of the bill to lawyers with a letter asking them to do something about having this law enacted. They suggest writing a letter to Senator Wagner and to the Congress asking them to support the bill, to have the Washington Bar Assn. and the home state bar associations, and Boards of Commerce pass resolutions favoring the bill, and to contribute $1 for postage, printing and circulating the bill throughout the country.

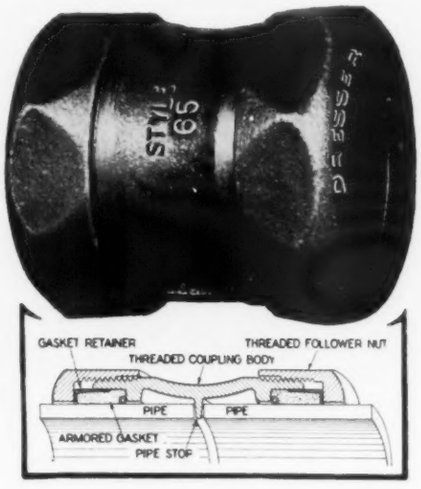
Many cases before the Commission for members of the nonmetallic-minerals industry have been handled by registered practitioners who are not attorneys, but who have a comprehensive knowledge of the requirements of the Interstate Commerce Act, procedure before the Commission, and the rate structures relating to the products of the industry.

While it is contended that the purpose of the proposed law is to drive out racketeers who have been representing injured workers in claims under the Federal Workmen's Compensation Act before the United States Labor Bureau, it would also eliminate registered practitioners before the Interstate Commerce Commission who are not licensed lawyers.

New Machinery and Supplies

New Compression Coupling for Connecting Pipe Ends

Several unusual features are incorporated in a new, self-contained pipe joint just announced by the S. R. Dresser Mfg. Co. of Bradford, Pa. To make a connection with this new joint, called the Dresser Style 65 Compression Coupling, nothing is needed except the pipe (plain end), the joint itself and an ordinary wrench. Making the joint simply involves inserting the pipe ends into the coupling (which comes



Self-contained pipe coupling.

assembled) and then tightening two threaded octagonal nuts—the whole operation taking only a few seconds.

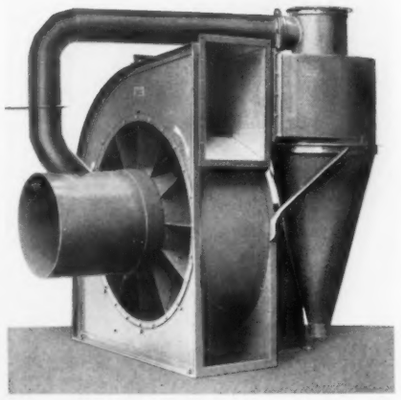
As the nuts are tightened, two resilient "armored" gaskets are compressed tightly around the pipe, gripping it with great force and giving a positive seal. The principle involved is essentially the same as that used in other Dresser couplings for the past 50 years.

The resulting joint is said to be not only permanently tight but absorbs normal vibration, expansion and contraction movements, and permits deflections of the pipe in the joint. Other advantages claimed are: The pipe need not be cut to exact lengths; joint making in cramped quarters is simplified; repairs on old lines can be quickly and easily made; and the joint is suitable for exposed lines because of its compact appearance. These compression couplings are supplied, black or galvanized, in standard steel pipe sizes from ⅜-in. I.D. to 2-in. I.D. inclusive.

Dust-Collector Made of Electrically-Welded Plate

The American Air Filter Co., Inc., Louisville, Ky., has developed the new Type F Roto-Clone. The paramount reason for developing this new type of Roto-Clone was that the upper limit or size in the cast-iron construction was reached with the No. 24 Type D and larger sizes could be built only in steel plate construction in order to stay within practical limits of weight and manufacturing costs.

The new design is built of heavy plate, ranging from 3/16-in. thick for the small sizes up to ⅜-in. thick for the larger sizes and is electrically welded throughout. The impeller disk is a flat plate laminated for uniform strength. The blades are straight instead of curved but are fastened to the disk at an angle and inclined toward the direction of rotation. The dust scroll is parallel with the air scroll and is separ-



Dust-collector of welded steel-plate construction.

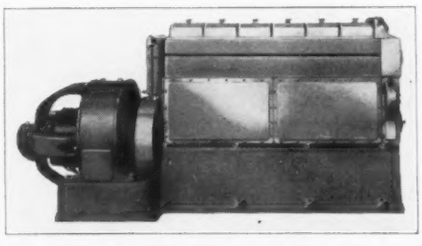
ated from the air scroll by means of a splitter plate. All models are belt-driven and the shaft is carried by two ball or roller bearings.

The Type F Roto-Clone consists of the Roto-Clone or precipitator, concentrator, return air connection and short inlet piece at Roto-Clone intake. Depending on the total pressure of the system, from 6 to 10 per cent. of the primary air enters the dust scroll. This secondary air, together with the dust, passes into a concentrator which is mounted directly on the Roto-Clone and which separates the dust from the secondary air. The dust is discharged at the bottom of the cone and the air is returned to the Roto-Clone inlet. A damper in the return line makes it possible to adjust the air volume in the secondary circuit.

In order to function properly, the concentrator must remain empty at all times, and the material must be discharged continuously into an air-tight bin connected to the dust outlet of the concentrator. In some installations, the operating characteristics of the system are such that a neutral pressure can be obtained at the dust outlet and the material discharged on a belt conveyor or into an open storage bin. In other cases, a balanced gate at the bottom of the concentrator will permit open discharge of the material. Blower characteristics of the Type F Roto-Clone are very similar to that of the Type D. The efficiency of dust separation of the two types is said to be identical. The Type F Roto-Clone, due to its straight blade design, has been found to be particularly well adapted to handle moist dusts without danger of clogging.

Diesel Engines Utilize Automatic Relief Injection

The Cooper-Bessemer Corp., Mt. Vernon, O., has developed a new "N" line of multi-cylinder Diesel engines. Progress is said to have been centered on three objectives in the design of these engines. The first objective was to keep the design specifically Diesel, borrowing little or nothing from the designs of other types of prime movers. Second is the use of materials specifically suited to the conditions of Diesel operation. Third, the perfection of a fuel-injection system which would overcome the disadvantages and retain the advantages of previous methods.

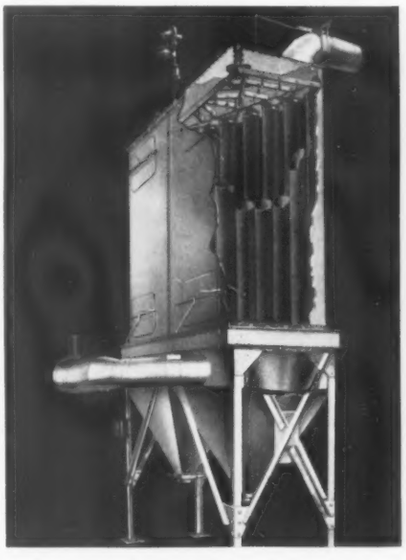


Diesel engine with atmospheric-relief injection.

Four new engineering developments are common to this new line of engines. Steel through bolts connect the cylinder heads to the bases, putting the cylinder block and center frame in compression. Cylinder liners are suspended from cylinder heads and a patented wrist-pin is said to practically double the effective wrist pin bearing areas. On all of these engines except the smallest type a patented atmospheric relief injection system is used. The largest of these engines is the Type GN, rated 50 to 75 hp. per cylinder. Type EN is rated 20 to 47 hp. per cylinder and Type BN is 10 to 22½ hp. per cylinder.

Static Pressure Control Features Dust-Collector

The American Foundry Equipment Co., Mishawaka, Ind., announces the new American continuous dust collector with static pressure control. This control automatically maintains a constant minimum static pressure loss in the filter and



Dust-collector using static pressure control.

regulates the cleaning of filter cloth. This is said to result in constant and effective dust removal from the equipment being served, reduced fan operating cost, less power, more flexible operation, and reduction in the size of the required dust collector.

The dust-laden gas or air enters the hopper of each unit into which is built a primary separator made up of concentric baffles, the outer one being cylindrical and the inner one conical. The modified cyclonic action set up is said to deposit only the particles large enough to cause excessive wear while the remaining dust is carried to the filter bags. Suction draws the air through the bags. At a determined point of allowed static the automatic differential control unit, through a mercoid switch, starts the timer motor which controls the cleaning cycle. In predetermined cycles each unit is in turn automatically

cut off the line, cleaned for about five seconds, and put back into operation. A compressed air cylinder moves the bag supporting the spider up and down very rapidly to break the deposited dust loose from the bag walls. The cleaning cycles are controlled solely by the gradual building up of the layer of dust to the point where efficiency would begin to drop by reason of the resistance caused by the dust.

The pneumatic vibrating device is fastened at a single point to the tube rack, from which the tubes are suspended by adjustable hooks fastened to metal caps on the tubes. Dust-tight doors at the top and bottom of the housing give quick access to the interior. The tube housing is constructed of 12-gauge sheet steel coated with rust-resisting paint and all joints are flanged and bolted with air-tight dust seals. An air damper automatically opens when a compartment is being cleaned and this is said to cause a slight backflow of air which deposits suspended dust.

Safety Shoes Have Light-Weight Spring-Steel Guard

The Portable Lamp and Equipment Co., Pittsburgh, Pa., is distributing the new Strauss foot-guard to the mining industry, a device designed to protect the feet from

Safety shoes with spring-steel guard.

falling or rolling objects. This new, light-weight guard, made of high carbon spring steel, grips the sole of the shoe beneath the instep. A flat spring, mounted on the inside of the guard and free on one end, rests on top of the shoe and permits the guard to ride clear of the floor. The guard stays in place, allows free movement of the foot and tests 3600 load pounds.

Truck Carries Complete Crushing Plant on Chassis

A new portable rock crusher unit has been developed by the Four Wheel Drive Auto Co., Clintonville, Wis. The new machine consists of a 3-ton FWD truck of the seat-over-motor type equipped with an overhead eccentric type rock crusher mounted on the rear of the frame and driven by the truck motor. The crusher is equipped with continuous bucket feeding

Truck-mounted crushing plant.

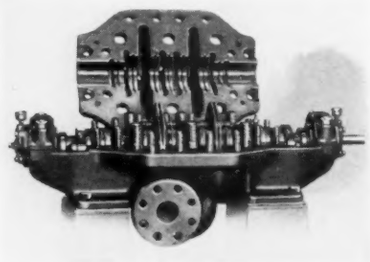
and loading elevators of the belt type. This portable crusher is designed to answer the demands for a machine which can be speedily moved from one location to another. It is especially adaptable for use along highways being surfaced.

The rock crusher is driven direct from the main shaft of the transmission. With a governed engine speed of 1200 r.p.m. in direct drive and by means of a four-to-one reduction in the drive sprockets of the crusher, a crushing speed of 300 r.p.m can be maintained. The rated capacity of the unit at this speed ranges from 50 to 125 tons per day, varying in accordance with the hardness and size of the stone and gravel used.

The four driving wheels of the truck enable it to negotiate the "tough going" encountered in moving to and from location. Its short wheelbase gives it the maneuverability necessary to the reaching of stone and gravel supplies located in cramped quarters.

Multi-Stage Pumps Use Double Suction Runners

The new Type "MM" multi-stage pump, developed by Allis-Chalmers Manufacturing Co., Milwaukee, Wis., for heads from 400 to 1600 ft., and capacities up to 400 gallons per minute, is designed along the general lines of the Allis-Chalmers Type "M" pump. "MM" pumps are horizontal shaft, split casing, double suction, bronze fitted . . . the use of double suction runners equalizes end thrust and eliminates the use of internal balancing arrangements. Each stage of the casing has a spiral volute and between stages the liquid flows from one volute into an exceptionally long diffusion nozzle and then into a long sweep return bend to the



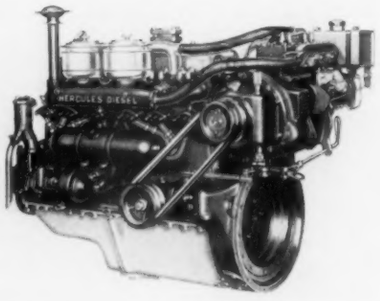
New multi-stage pump.

inlet passages of the following stage. This construction is said to result in maximum practical regain of pressure between stages as the liquid is directed along smooth flow lines without sudden changes in velocity. The pressure on the stuffing boxes is kept to approximately the suction pressure. They are said to be particularly economical for boiler feed, mine drainage, sluicing and other high head pumping services.

Designs Gasoline Engine to Start Diesel Engines

The Hercules Motors Corp., Canton, O., has developed a gasoline engine starting unit for both the DXHB 6-cyl. 5 by 6-in., and the DRXB 6-cyl. 4⅜ by 5¼-in. Diesel engines and power units. The gasoline engine used is the Hercules Model ZXB, a 4-cyl., 2⅝ by 3-in. unit. This engine is equipped with magneto, air cleaner, governor and other accessories including a small gasoline tank. The controls, switch, choke, crank and throttle are all located on the front of the engine, which is on the right side of the Diesel looking at the fly-wheel end, where they are easily accessible.

This gasoline engine cranks the Diesel engine by a pinion on the usual flywheel ring gear. The engine drives the pinion by V-belts and a clutch disengages the



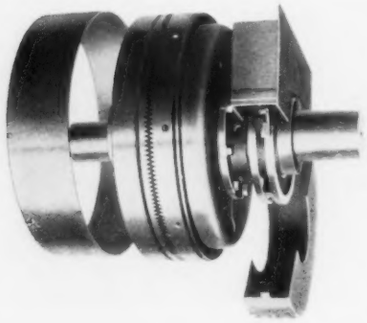
Diesel engine with gasoline starting engine.

gasoline engine. The operation of this clutch is inter-connected with the shifting of the pinion into cranking position on the ring gear. After the gasoline engine is started, which may be done by either a starting motor or by hand cranking, the operating lever is moved to engage the clutch. The first movement of the lever engages the pinion in the ring gear and further motion engages the clutch and cranks the Diesel engine. When the Diesel has started the cranking pinion is automatically thrown out of mesh by the reverse of torque.

The water pump on the gasoline engine circulates the water through the cylinder block of the Diesel engine to warm the cylinders, heads and lubricating oil in cold weather. The exhaust from the gasoline engine is piped through a special manifold on the Diesel as a further aid in cold weather starting.

Claim High Torque for New Magnetic Clutch Coupling

The Dings Magnetic Separator Co., Milwaukee, Wis., has developed a newly-patented magnetic clutch coupling which is said to insure positive quick engagement and disengagement with less than 1½ degrees of slip. This Type SC clutch



Magnetic clutch coupling for which instant engagement and disengagement is claimed.

is said to transmit unusually high torque, five times that of an ordinary friction type clutch of the same diameter. Internal coil springs disengage the clutch. Bronze teeth engage steel teeth in the outer periphery. Lag, due to residual magnetism, is said to be overcome entirely. Instant disengagement is said to follow and engagement is so rapid that racking of the teeth is impossible.

Flexible Pin-Type Coupling Available in Improved Form

The Medart Co., St. Louis, Mo., announces that it has improved the Medart flexible pin-type coupling. This unit con-

sists of two halves which are connected by driving pins made of Textolite which have a high heat-resisting and compression value. The pins are accessible and inexpensive to replace. A steel retaining ring bolted to the outer shell holds the driving pins in place. Although Textolite pins are standard, pins of other material such as rubber, leather or wood may be furnished for special conditions.

Improved flexible pin type coupling.

Wide-Strip Pyrometer Uses Potentiometer Principle

The Bristol Co., Waterbury, Conn., announces, as an addition to its line of industrial instruments, the "wide-strip" pyrometer, which is available in single-record, multiple-record and recorder-controller types. This instrument, operating on the potentiometer principle of temperature measurement, has a built-in accuracy that is made possible through simple measuring, balancing, and recording mechanism.

A stainless-steel lead screw, operated by an electrical motor under the direction of two galvanometer-controlled contacts, adjusts the slide-wire contact and recording-pen unit to maintain e. m. f. balance in the potentiometer system. This mechanism, it is said, introduces an entirely new principle of operation into temperature measurement by means of the potentiometer method. The design of the balancing mechanism is such that all mechanical backlash is taken up, making it possible to magnify scarcely perceptible deflections of the galvanometer pointer. No clearance is required between the pointer and the chopper arms. Deflections smaller than 1/1,000 of an inch are easily measured.

The pen movement is always proportional to the size of the galvanometer deflection. This accounts for the quickness with which balance is restored and for the speed with which temperature changes are written on the chart.

Pyrometer which gives wide-strip record.

The slide-wire contact and recording pen are mounted on the same carriage. This feature, it is claimed, simplifies the mechanical construction of the instrument and eliminates errors due to backlash, lost motion, etc.

The carriage on which is mounted the slide-wire contact and recording pen runs on four wheels over a two-rail track. Three-point contact with the rails insures positive motion. It is driven through engagement with a hardened-steel pin by a stainless-steel lead screw. The lead screw, mounted on lubricated ball-bearings, is positively driven by an induction-type motor.

This pyrometer records on a 12¼-in. chart, is equipped with a 1¼-in. indicating scale that can be read easily at a distance; uses a heavy duty galvanometer which is totally inclosed in a dust-proof case; has a duplex slide wire mounted in such a position that the slide-wire contact and pen are integrally mounted on the same carriage; is designed and constructed to withstand an unusual amount of neglect and misuse; is housed in a convertible case which is moisture-, fume-, and dust-proof; is fully automatic in operation; is simple in construction; and is easy to service in the field by the user.

Announces New Convertible Shovel-Dragline Machine

A thoroughly modern digging unit, the 85-B, has been announced by the Bucyrus-Erie Co., South Milwaukee, Wis. The 85-B is offered to meet the requirements of quarry, mine, and heavy-duty construction. The machine combines the use of special, heat-treated alloy steels, modern electric-welded construction, and Ward-Leonard control.

The 85-B is fully convertible. A change from shovel operation to drag-line, or *vice versa*, can readily be made in the field with little loss of time. A few simple changes to the main machinery and to the front-end equipment are all that is necessary.

The base of the 85-B is of all-welded construction, and is supported on two heavy cast side girders which form the frame for the crawler rollers and tumblers.

Convertible shovel and drag-line.

The 85-B shovel carries a welded box-girder boom with outside dipper handles. The special rock dipper is made of two strong steel castings riveted and keyed together. The front is of manganese steel. The shape allows rock to enter easily, and flares out toward the bottom to insure free dumping. The dipper opening is always unobstructed because the bail is attached at the back of the dipper without the use of a padlock.

Full Ward-Leonard (variable-voltage) direct-current field control, with separately excited shunt-wound motor, allows the operator to complete the entire digging cycle without the use of brakes or clutches.

The 85-B, working as a shovel, weighs approximately 224,000 lb. As a drag-line it will handle a 3-cu.yd. heavy-duty bucket on a 65-ft. boom.

Designs Trailer to Carry Light-Weight Power Shovel

Low center of gravity and ease of loading and unloading have been emphasized in the new trailer unit especially designed for the P&H Bantamweight excavator introduced earlier this year by the Harnischfeger Corp. of Milwaukee. Loading is simplified by removing the front axle and placing ramp blocks to allow the machine to crawl above the frame, the front of which is then hoisted with the dipper so that the front wheels may be put in position as the machine settles on the trailer. The process is reversed in unloading. An average of only ten minutes is required for loading and ten minutes for unloading. With four dual wheels and a wheelbase of 174 in., the unit has a turning radius of only 30 ft. Swift travel is made safe with modern mechanical brakes on the rear wheels as well as an additional emergency hand brake. With its extremely low center of gravity, the unit can be towed safely even on highly-crowned roads. The main frame members are H-beams of Man-Ten steel for strength and lightness.

Shovel-carrying trailer having low center of gravity.

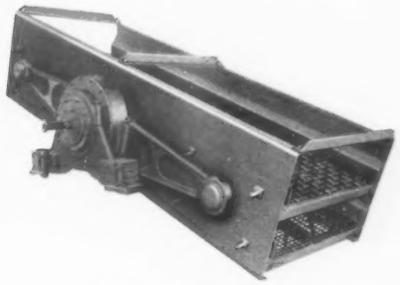
Positive Circle-Throw Screen Made in New Sizes

The Productive Equipment Corp., Chicago, announces a new size Type VA Selectro vibrating screen, an exact copy of the larger Type VB, incorporating advanced engineering design and all the features so necessary in modern equipment.

The machine is made in various sizes from 18 in. to 30 in. in width and 48 in. to 96 in. in length, in 1, 2 or 3 decks, in the open and fully-inclosed types.

The VA Model Selectro is a positive circle-throw vibrating screen—has such features as adjustable throw, oil lubrication, full tilting, full floating, safety, ruggedness, quick cloth change, one size self-aligning bearings, etc.

A compound eccentric, the parts of which may be adjusted in relation to each other to govern the amount of throw, is employed in the vibrator assembly. By adjustment of the two halves of the balance wheels the eccentricity of one can be arranged around the shaft so that it neutralizes the eccentricity of the other, or the eccentricity of both may be built up to create the greatest possible throw. It is thus that the extent of gyration (or throw) depends on the particular setting or position of the eccentrics, which may be any one of eight different adjustments giving a throw ranging from 0 to ¾ in. Each part of the compound eccentric carries its



Circle-throw vibrating screen.

own counterweight to balance the thrown weights. This counterweight is applied in the same plane as the eccentric force, thus eliminating a possible wobbling of the eccentrics. This design also prevents possible bending moments on the shaft, thereby allowing it to float. The balance plates are not changed or adjusted as they compensate automatically.

The assembly also allows quick, easy change from right- to left-hand drive, as the full-floating shaft is tapered on each and both ends are identical.

The working elements of the vibrator are fully inclosed and operating in a constant bath of oil completely sealed against dust or foreign matter, requiring but little attention as well as less horse power since there is no grease to congeal.

Correct tilt or inclination of the screen frame proper under varying conditions may be changed even with the screen in motion and is gaged by graduations on the housings to facilitate the proper setting at a glance. The screen frame is maintained in its proper fixed position with respect to the base by four stabilizer arms which extend in opposite directions from the vibrator assembly casings, and are fastened to it by hinge pins to allow free lateral movement of the arms. The extreme ends of these terminate in circular live-rubber disks, the hubs of which are secured to the side plates of the screen frame. These live disks allow free gyrating movement of the screen frame and, at the same time, keep the frame at the proper screening angle to which it has been set.

Induced-Draft Cooling Towers for Diesel Engines

The Binks Manufacturing Co., Chicago, has announced a new line of induced-draft cooling towers with a cooling capacity ranging from 5 to 200 gal. per min. These new type towers are recommended for all industrial plants using Diesel and

Diesel-engine cooling tower using induced draft.

other internal-combustion engines which need jacket-water cooling for their effective operation.

Water distribution in the new type induced-draft towers is secured through standard Binks patented low-pressure clog-proof "Rotojet" nozzles. The nozzles spray a finely-atomized mist of water downward through upward currents of air induced by the fan assemblies placed at the top of the tower, thus assuring maximum water and air contact. During cool weather, where towers are required for year-around operation, the fans may be shut off and ample cooling capacity secured without their use.

Depending upon the tower size and capacity, one or more fans are used, the fans being driven by individual splash- and weather-proof motors at speeds of approximately 450 r.p.m. All towers of the type K series are constructed of a heavy steel frame surrounded by a sectional copper-bearing galvanized-steel housing asphalted and aluminum-painted inside and out before shipment. Due to standardized features, all units can be quickly assembled on the job by ordinary labor without skilled supervision.

MANUFACTURERS' PUBLICATIONS

Drill Sharpener and Low Pressure Oil Furnace. (Ingersoll-Rand, New York, N. Y.) A folder illustrating the new drill-steel sharpener and new 27F oil furnace made by Ingersoll-Rand.

Fire Brick. 11 p. (The A. P. Green Fire Brick Co., Mexico, Mo.) A booklet, issued on the 25th anniversary of the company, giving a pictorial history of the company.

Pulsating Feeder Conveyor. (Syntron Co., Pittsburgh, Pa.) A bulletin describing and illustrating the pulsating feeder conveyor made by the company.

Trucks. 12 p. (The Four Wheel Drive Auto Co., Clintonville, Wis.) A booklet illustrates and describes the new model HS, 1½ ton truck produced by the company.

Compressors. (Worthington Pump and Machinery Corp., Harrison, N. J.) Four folders issued by the firm describing and illustrating the four models 105, 160, 210, and 315 gasoline motor driven air compressors.

SKF Bearings. 32-p. (SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.) Describes ball- and roller-bearing transmission appliances manufactured by this company. The book shows load ratings and diagrams of mountings for SKF ball- and roller-bearing pillow blocks, flanges housings, take-up boxes, post and drop hangers, floor stands, replace boxes, locknuts and lockwashers.

Other recent SKF publications are the library volume and pocket size edition of Engineering Data Sheets; a catalog featuring roller-bearing applications; roller-bearing applications in rolling stock; and supplementary price lists.

Hytempite. 4 p. (Bulletin No. 316, Refractories Division, Quigley Co., Inc., New York, N. Y.) Describes and illustrates a high-temperature cement made by this company.

Master Mixer. 4 p. (Concrete Transport Mixer Co., St. Louis, Mo.) Describes and illustrates new concrete mixers.

Speed Control Handbook. 112 p. (Reeves Pulley Co., Columbus, Ind.) Contains complete information on modern methods of variable speed regulation for industrial machines of all types, and describes and illustrates in detail the variable-speed transmission and Vari-Speed motor pulley made by this company.

Condor V-Belts. 4 p. (Bulletin No. 6840, Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J.) Describes and illustrates Condor V-belts.

Information Helpful in Specifying Wire Rope. 4 p. (Macwhyte Co., Kenosha, Wis.) Describes and illustrates wire rope made by this company.

Dresser Couplings for Water Lines. 16 p. (Form 355, S. R. Dresser Manufacturing Co., Bradford, Pa.) Describes and illustrates pipe joints made by this company.

Power Selsyns. 4 p. (No. 10M, General Electric Co., Schenectady, N. Y.) Describes and illustrates self-synchronous apparatus manufactured by this company, for such applications as hoists, conveyors, elevators, kiln drives, etc.

Air Cushion Valve Vacuum Pumps. 12 p. (Bulletin No. 166, Pennsylvania Pump & Compressor Co., Easton, Pa.) Describes and illustrates Class 7-AT and 8-AT roller-bearing type vacuum pumps made by this company.

Centrifugal Pumps. 4 p. (Bulletin No. 224, Pennsylvania Pump & Compressor Co., Easton, Pa.) Describes and illustrates sleeve-bearing pumps made by this company.

Procedure Handbook of Arc Welding Design and Practice. 586 p. (Lincoln Electric Co., Cleveland, O.) Encyclopedic in scope and content, the new Handbook contains 8 principal sections, each dealing with an important phase of arc welding. There are over 700 illustrations, consisting of detailed drawings and photographs. Practically every use and application of arc welding is covered.

High-Speed Synchronous Motors. 4 p. (5-M, General Electric Co., Schenectady, N. Y.) Describes and illustrates "7500 Series" high-speed synchronous motors manufactured by this company.

Arc Welding Electrodes and Accessories. 36 p. (Form 20-M, Lincoln Electric Co., Cleveland, O.) Describes and illustrates arc welders, electrodes and accessories manufactured by this company.

Wire Cloth. 56 p. (Catalog No. 40, The Audubon Wire Cloth Co., Richmond St. and Castor Ave., Philadelphia, Pa.) Covers the company's complete line, including illustrations, descriptions, specifications and list prices, together with tables and useful information for selecting and specifying wire cloth. It is in 3 sections, Mesh Wire Cloth, Space Wire Cloth and Flexible Wire Cloth. The firm's 16-p. Catalog No. 41, featuring Flexible Wire Cloth, is a reprint of that section in the general catalog. The 8-p. condensed Catalog No. 42 describes the entire line, but includes no specifications or prices.

Koroseal. 12 p. (No. 1050, The B. F. Goodrich Co., Akron, Ohio.) Describes and illustrates a new synthetic rubber-like material.

Boiler Plant Equipment. 4 p. (Combustion Engineering Co., Inc., New York, N. Y.) Describes in condensed form all types of boilers, complete steam-generating units, stokers, pulverized-fuel systems and heat-recovery equipment furnished by this company.

C-E Stoker-Unit. 4 p. (Combustion Engineering Co., Inc., Industrial Stoker Division, New York, N. Y.) Describes and illustrates C-E stoker-units manufactured by this company.

Handbook of Goodrich Industrial Tires. 24 p. (Stock No. 7636GB, B. F. Goodrich Co., Akron, O.) Describes and illustrates rubber tires for industrial purposes.

Belt Conveyors. 112 p. (Catalog No. 610, The Jeffrey Mfg. Co., Columbus, O.) Describes and illustrates belt-conveyors and accessories.

Dust Collection and Elimination. 8 p. (Buell Engineering Co., Inc., New York, N. Y.) Describes and illustrates the dust separator (Van Tongeren system) manufactured by this company.

Buell Dryers. 24 p. (Buell Engineering Co., Inc., New York, N. Y.) Describes and illustrates driers (Buttner System) for minerals, agricultural products and the chemical and allied industries manufactured by this company.

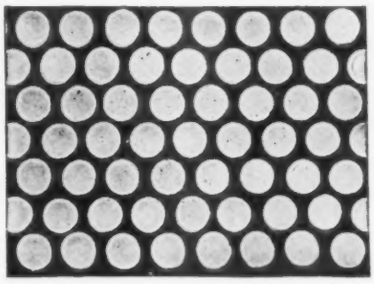
Earth Moving and Material Handling. 16 p. (Browning Crane & Shovel Co., Cleveland, O.) Describes and illustrates a complete line of steam, gasoline, Diesel or electric-powered material-handling equipment.

Drilling 10 O'clock Holes in Rock! 16 p. (Bulletin No. 109, Cleveland Rock Drill Company, Cleveland, O.) Describes and illustrates the Universal drill rig manufactured by this company.

Worthington Steam Booster Compressors. 4 p. (Bulletin L-611-B3A, Worthington Pump and Machinery Corp., Harrison, N. J.) Describes and illustrates compressors manufactured by this company.

Worthington Deep Well Turbine Pumps. 4 p. (Bulletin W-450-B19, Worthington Pump and Machinery Corp., Harrison, N. J.) Describes and illustrates the company's Types Q and QA deep-well turbine pumps.

MORROW SCREEN PLATES



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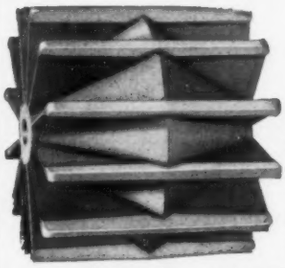

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Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

Although every effort is made to insure accuracy and completeness in these listings, the publisher cannot accept responsibility for errors or omissions. Any mistakes discovered will gladly be rectified, if brought to the attention of the Advertisers' Service Department.

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*Hardinge Co.

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Chicago Pneumatic Tool Co.

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*Ensign-Bickford Co.

Blocks (Sheave)
American Manganese Steel Co.
Haiss Mfg. Co., Geo.
*Sauerman Bros., Inc.
Sprout, Waldron & Co.

Bodies (Motor Truck, Concrete Mixing)
Jaeger Machine Co.

Boots (Rubber)
Goodyear Tire & Rubber Co.

Borings, Core
Mott Core Drilling Co.
Pennsylvania Drilling Co.

Bronze Work (Ornamental)
Smith Wire & Iron Works, F. P.

Bucket Elevators (See Conveyors and Elevators)

Buckets (Clamshell, Orange-Peel, Etc.)
Haiss Mfg. Co., Geo.
*Harnischfeger Corp.
*Link-Belt Co.
Pettibone Mulliken Co.
Wellman Engr. Co.

Buckets (Dragline—Cableway)
American Manganese Steel Co.
*Link-Belt Co.
*Pioneer Gravel Equipment Mfg. Co.
*Sauerman Bros., Inc.
Wellman Engr. Co.

Buckets (Elevator and Conveyor)
Cross Engr. Co.
Haiss Mfg. Co., Geo.
*Hendrick Mfg. Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.
McLanahan and Stone Corp.
Pettibone Mulliken Co.
*Pioneer Gravel Equipment Mfg. Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

Bulk-Cement Storage Plants
Sprout, Waldron & Co.

Cableways
*American Steel & Wire Co.
*Link-Belt Co.
*Roebling's Sons Co., John A.
*Sauerman Bros., Inc.

Caps (Blasting)
Du Pont de Nemours & Co., E. I.

Capstans (See Winches and Capstans)

Car Dumpers
*Link-Belt Co.

Car Pullers
*Jeffrey Mfg. Co.
*Link-Belt Co.
Wellman Engr. Co.

Carriers
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

Car Wheels — (See Wheels — Car)

Castings
American Manganese Steel Co.
*Eagle Iron Works
*Hardinge Co.
Hetherington & Berner, Inc.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
*Link-Belt Co.
McLanahan and Stone Corp.
Pettibone Mulliken Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Cement Pumps (See Pumps; Air Pumps; Pumps, Cement Slurry; Pumps, Bulk Cement)

Central Concrete-Mixing Plants (Complete)
Sprout, Waldron & Co.

Chain (Dredge and Shovel)
Manganese Steel Forge Co.
Ryerson & Son, Joseph T.

Chain Drives
*Link-Belt Co.

Chain (Elevating and Conveying)
American Manganese Steel Co.
Cross Engr. Co.
Haiss Mfg. Co., Geo.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.
Sprout, Waldron & Co.

Chutes and Chute Liners
American Manganese Steel Co.
Cross Engr. Co.
Goodyear Tire & Rubber Co.
Haiss Mfg. Co., Geo.
*Hendrick Mfg. Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Morrow Mfg. Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Classifiers
*Deister Machine Co.
*Hardinge Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machine Co.
*Link-Belt Co.

Clips (Wire Rope)
*American Steel & Wire Co.
*Roebling's Sons Co., John A.

Clutches
*Jeffrey Mfg. Co.
*Link-Belt Co.
Sprout, Waldron & Co.

Coal-Pulverizing Equipment
*Allis-Chalmers Mfg. Co.
Bonnot Co.
*Hardinge Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Raymond Bros. Impact Pulv. Co.

Compressors (See Air Compressors)

Concentrators (Slurry)
*Deister Concentrator Co.

Concrete Breakers
Chicago Pneumatic Tool Co.

Concrete Mixers
Jaeger Machine Co.
Koehring Co.

Concrete Slab-Raising Equipment (Mud-Jacks)
Koehring Co.

Condensers
Chicago Pneumatic Tool Co.

Cones (Sand-Washing)
Iowa Mfg. Co.
*Link-Belt Co.
Smith Engr. Works

Conveyor Belting (See Belting)

Conveyor Idlers and Rolls
Haiss Mfg. Co., Geo.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Conveyors and Elevators
*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
Cross Engr. Co.
Dracco Corp.
*Gruendler Crusher & Pulverizer Co.
Haiss Mfg. Co., Geo.
*Hendrick Mfg. Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
*Link-Belt Co.
McLanahan and Stone Corp.
Morrow Mfg. Co.
New Holland Machine Co.
*Pioneer Gravel Equipment Mfg. Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.
Sturtevant Mill Co.

Conveyors (Pneumatic)
Dracco Corp.

Conveyors (Ready-Mixed Concrete)
Haiss Mfg. Co., Geo.
Jaeger Machine Co.
*Link-Belt Co.
*Robins Conveying Belt Co.

Coolers (See Kilns and Coolers—Rotary)

Couplings (Flexible and Shaft)
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Couplings (Hose)
Chicago Pneumatic Tool Co.

Cranes (Crawler and Locomotive)
*Harnischfeger Corp.
Koehring Co.
*Lima Locomotive Works, Inc.
*Link-Belt Co.

Cranes (Overhead)
*Harnischfeger Corp.

Crusher Parts
American Manganese Steel Co.
*American Pulverizer Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
McLanahan and Stone Corp.
Pettibone Mulliken Co.

Crushers (Cone)
Nordberg Mfg. Co.

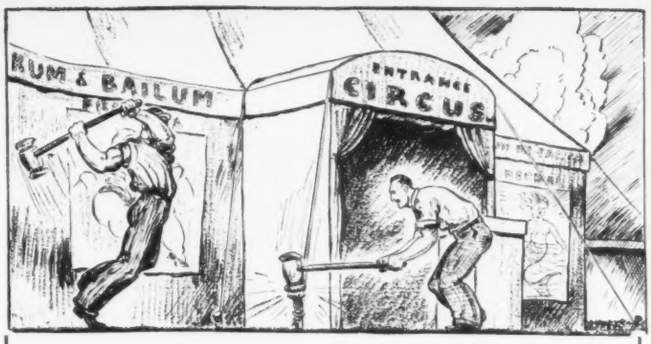
Crushers (Hammer)
*Allis-Chalmers Mfg. Co.
*American Pulverizer Co.
Bonnot Co.
*Dixie Machy. Mfg. Co.
*Gruendler Crusher & Pulverizer Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Sturtevant Mill Co.

Crushers (Jaw and Gyratory)
*Allis-Chalmers Mfg. Co.
*Gruendler Crusher & Pulverizer Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
New Holland Machine Co.
Nordberg Mfg. Co.
*Pioneer Gravel Equipment Mfg. Co.
Smith Engr. Works

Crusher (Ring)
*American Pulverizer Co.

Crushers (Roll)
*Allis-Chalmers Mfg. Co.
*American Pulverizer Co.
Bonnot Co.
*Gruendler Crusher & Pulverizer Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
*Link-Belt Co.
McLanahan and Stone Corp.
New Holland Machine Co.
*Pioneer Gravel Equipment Mfg. Co.
*Robins Conveying Belt Co.

*** See also information in the 1935 Pit and Quarry HANDBOOK.**



TWO BLOWS or ONE

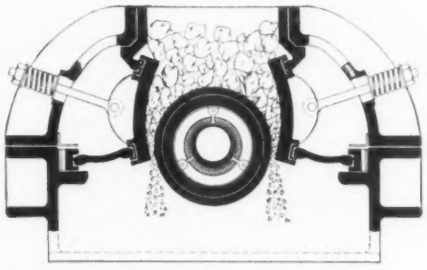
We often stood by and watched the circus roustabouts drive stakes, working with perfect rhythm and at high speed. The Bonnot Crusher using the same principle, two blows instead of one, no idle back stroke, or 750 blows per minute, turns out quality crushed material at high speed—no wasted effort.

Users say:

"We take pleasure in recommending this crusher."—Ohio.

"We believe that you have a knock-out in the line of crushers."—Texas.

SPEED



Not a roll crusher. Featuring slow creep mantle for distribution of wear

Manufactured under U. S. Patent No. 1946763

750 BLOWS PER MINUTE

THE BONNOT CO.

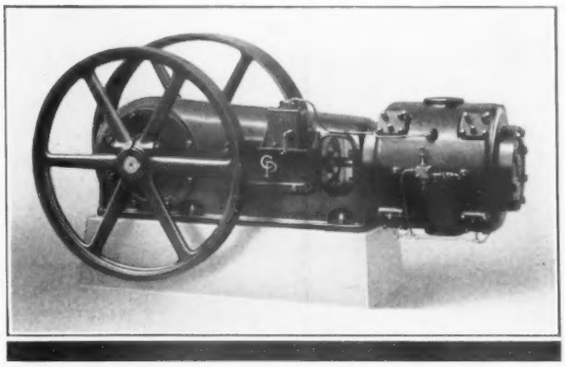
CANTON, OHIO

— SINCE 1891 —

New York Office: 59 Church Street

TYPE T HORIZONTAL SINGLE-STAGE AIR COMPRESSOR

Double-acting; water-cooled; arranged for belt and direct-connected motor drive; for permanent and semi-permanent installation; capacities from 89 to 1293 cu. ft. per min.



A PROMISE . . . FULFILLED

New . . . modern . . . smoothly "streamlined" . . . Type T Compressor gives outward promise of the high efficiencies within . . . a promise that is generously fulfilled by such salient features as:

- SIMPLATE VALVES
- LARGE, SMOOTH AIR PASSAGES
- CYLINDER AND HEADS LIBERALLY WATER-JACKETED
- TAPERED ROLLER MAIN BEARINGS
- CYLINDER, CROSSHEAD FACES AND CROSS-HEAD GUIDES GROUND TO SIZE
- WEDGE-ADJUSTABLE CONNECTING ROD
- INLET VALVE UNLOADING SYSTEM
- DOUBLE-COUNTERWEIGHTED CRANKSHAFT
- COMPLETELY ENCLOSED FRAME WITH OIL-TIGHT AND DUST-PROOF COVERS

How and *why* these and other features of the Type T Air Compressor contribute to its high operating efficiency, its long life and its low maintenance cost, are fully described and illustrated in Bulletin No. 728. Send for your copy . . . today.

CHICAGO PNEUMATIC TOOL CO.

6 EAST 44th STREET NEW YORK, N. Y.

Manufacturers of

AIR & GAS COMPRESSORS
ROCK DRILLS
DIESEL ENGINES
ELECTRIC TOOLS
PNEUMATIC TOOLS
VACUUM PUMPS & CONDENSERS

Classified Buyers' Guide

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Bonnot Co.
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*Link-Belt Co.
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Hoffman Bros. Drilling Co.
Mott Core Drilling Co.
Pennsylvania Drilling Co.

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Hoffman Bros. Drilling Co.
Mott Core Drilling Co.
Pennsylvania Drilling Co.

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*Jeffrey Mfg. Co.

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*Allis-Chalmers Mfg. Co.

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*Allis-Chalmers Mfg. Co.
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*Hardinge Co.
Iowa Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
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McLanahan and Stone Corp.

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Parsons Engr. Corp.

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*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
Dracco Corp.
Parsons Engr. Corp.
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*Allen-Sherman-Hoff Co.
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Parsons Engr. Corp.

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*Robins Conveying Belt Co.
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Nordberg Mfg. Co.

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Nordberg Mfg. Co.

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*Robins Conveying Belt Co.
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*American Steel & Wire Co.
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Smith Wire & Iron Works, F. P.

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*Allen-Sherman-Hoff Co.

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*Link-Belt Co.
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*Hendrick Mfg. Co.
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Pettibone Mulliken Co.
*Robins Conveying Belt Co.
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*Harnischfeger Corp.
Hetherington & Berner, Inc.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
McLanahan and Stone Corp.
*Pioneer Gravel Equipment Mfg. Co.
*Sauerman Bros., Inc.
Smith Engr. Works
Sprout, Waldron & Co.

Hoppers
*Hendrick Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.

Hose (Air, Steam and Water)
Chicago Pneumatic Tool Co.
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Hose (Radiator-Engine Cooling)
Goodyear Tire & Rubber Co.
Republic Rubber Co.

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Idlers
American Manganese Steel Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

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*Allis-Chalmers Mfg. Co.
Bonnot Co.
*Hardinge Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

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*Hardinge Co.

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Goggle Parts Co.

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*Hardinge Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Raymond Bros. Impact Pulv. Co.
*Robins Conveying Belt Co.

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*Hardinge Co.

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*Hardinge Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

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Loaders and Unloaders
Haiss Mfg. Co., Geo.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

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*Lima Locomotive Works

Locomotives (Trolley-Battery)
*Jeffrey Mfg. Co.

Magnetic Pulleys (See Pulleys, Magnetic)

Manganese Steel
American Manganese Steel Co.
Manganese Steel Forge Co.
Pettibone Mulliken Co.
Ryerson & Son, Joseph T.

Manganese Steel (Plates and Sheets)
American Manganese Steel Co.
Manganese Steel Forge Co.
Pettibone Mulliken Co.
Ryerson & Son, Joseph T.

Mechanical Rubber Goods
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Mill Liners and Linings
American Manganese Steel Co.
*Hardinge Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

Mills (Grinding) (See also Crushers—Hammer)
*Allis-Chalmers Mfg. Co.
*American Pulverizer Co.
Bonnot Co.
*Hardinge Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdy. & Mch. Co.
Raymond Bros. Impact Pulv. Co.
Sprout, Waldron & Co.

Motors and Generators
*Allis-Chalmers Mfg. Co.
*Harnischfeger Corp.

Motors (Internal-Combustion) (See Engines — Internal-Combustion)

Nails
*American Steel & Wire Co.
Ryerson & Son, Joseph T.

Netting (Locomotive Stack)
Smith Wire & Iron Works, F. P.

Nozzles (Gravel Washing)
*Deister Concentrator Co.

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*Deister Concentrator Co.

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Goodyear Tire and Rubber Co.
Republic Rubber Co.

Partitions (Wire)
Smith Wire & Iron Works, F. P.

Paving Mixers
Jaeger Machine Co.
Koehring Co.

Perforated Metal Plates
*Allis-Chalmers Mfg. Co.
Chicago Perforating Co.
Cross Engr. Co.
*Hendrick Mfg. Co.
Morrow Mfg. Co.
Ryerson & Son, Joseph T.
Sprout, Waldron & Co.

Pipe, Dredge (Floating and Shore)
Taylor Forge & Pipe Works

Pipe Flanges
Hetherington & Berner, Inc.
Ryerson & Son, Joseph T.
Taylor Forge & Pipe Works

Pipe Forms (Concrete)
Quinn Wire & Iron Works

Pipe Machines (Concrete)
Quinn Wire & Iron Works

Plug Valves (See Valves)

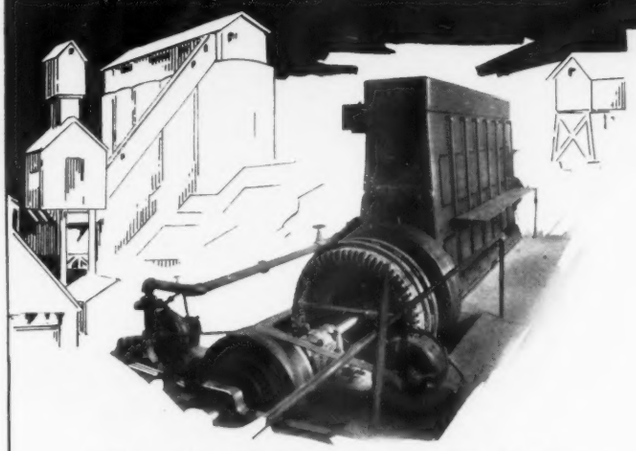
Pneumatic Drills (See Drills, Rock)

Portable Conveyors
Haiss Mfg. Co., Geo.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Portable Crushing and Screening Plants
*Gruendler Crusher & Pulverizer Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.

*** See also information in the 1935 Pit and Quarry HANDBOOK.**

WOULD YOU LIKE TO KNOW MORE ABOUT LOW COST DIESEL POWER *for Your Plant?*



A Few Advantages of Buckeye Diesel Power

Low fuel cost. Maximum dependability. Simplicity in operation. Large water supply unnecessary. Compact. Instant Starting. No standby losses. No smoke or ashes. No demand charges. Independent of outside sources of power. Additional units may be added without revamping entire power plant.

IF your power costs have been running high . . . if you would like to compare your present steam or electric power cost with Diesel Power Costs . . . Buckeye Engineers will gladly make a power survey of your plant—at no cost or obligation to your Company whatsoever.

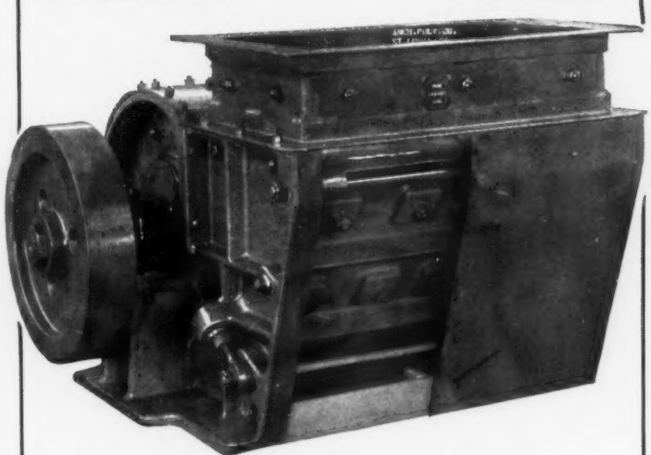
Data showing savings, cost of new Diesel Equipment, plans for installation in your plant, and full information will be gladly given.

An opportunity to give you this information by our Engineers will be appreciated. Write us today.

THE BUCKEYE MACHINE CO.
LIMA OHIO
ENGINE BUILDERS SINCE 1908

BE PROFITWISE AND DIESELIZE *with Buckeye*

AMERICAN *ROLLING RING* **CRUSHER**



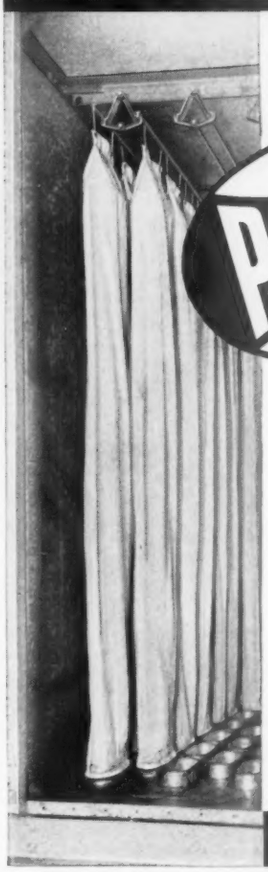
Front View Showing Breaker Plate Adjustment

LOW FIRST COST makes the American Crusher a prime investment. Easy to install, dismantle and move.
LOWER OPERATING COST because the American takes less power per ton of product. Flexible rotor assures protection from injury of tramp iron.
LOWER MAINTENANCE COST as the Rolling Rings wear many times longer than hammer surfaces.

Write today for facts on why the American Rolling Ring Crusher gives a more uniform product, with minimum fines and no slivers or chips.

AMERICAN PULVERIZER COMPANY
1289 Macklind Ave. St. Louis, Mo.

OVAL BAG DUST ARRESTORS ✦ BLAST ROOMS ✦ OSCILLATING BLAST BARRELS ✦ EXHAUST SYSTEMS



PARSONS
PARSONS ENGINEERING CORPORATION CLEVELAND

Parsons Oval Bag Dust Arrestors combine the advantages of the screen and cylinder types.

Write for Bulletin DA-5.

PARSONS ENGINEERING CORPORATION
Cleveland Ohio

Classified Buyers' Guide

A Directory of PIT AND QUARRY Advertisers Arranged According to Product

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Sprout, Waldron & Co.

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*Hardinge Co.
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Raymond Bros. Impact Pulv. Co.

Pulverizers (See also Crushers; Mills; etc.)
*American Pulverizer Co.
Bonnot Co.
*Gruendler Crusher & Pulverizer Co.
*Hardinge Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
New Holland Machine Co.
Raymond Bros. Impact Pulv. Co.
Sturtevant Mill Co.

Pump Valves (See Valves Pump)

Pumps (Air-Lift)
Chicago Pneumatic Tool Co.

Pumps (Cement Slurry)
*Allen-Sherman-Hoff Co.
*Morris Machine Works

Pumps (Centrifugal)
*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
Hetherington & Berner, Inc.
Kansas City Hay Press Co.
*Morris Machine Works
Pettibone Mulliken Co.

Pumps (Dredging)
*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
Hetherington & Berner, Inc.
*Morris Machine Works
Pettibone Mulliken Co.

Pumps (Sand and Gravel)
*Allen-Sherman-Hoff Co.
*Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
Hetherington & Berner, Inc.
Kansas City Hay Press Co.
*Morris Machine Works
Pettibone Mulliken Co.

Pumps (Sump)
Chicago Pneumatic Tool Co.

Pumps (Vacuum)
Chicago Pneumatic Tool Co.

Respirator Parts
Goggle Parts Co.

Respirators
Goggle Parts Co.

Rock Drills (See Drills—Rock)

Rod Mills
*Hardinge Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.

Rods (Welding)
American Manganese Steel Co.
McLean Welded Products Corp.
Ryerson & Son, Joseph T.

Roofing and Siding (Steel)
Ryerson & Son, Joseph T.

Rope (Wire) (See Wire Rope)

Rubbish Burners
Cross Engr. Co.

Safety Equipment
Goggle Parts Co.

Sand Separators
*Jeffrey Mfg. Co.
*Link-Belt Co.
McLanahan and Stone Corp.
*Pioneer Gravel Equipment Mfg. Co.
Smith Engr. Works

Sand—Lime—Brick Machinery
*Hardinge Co.

Sand-Settling Tanks
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Pioneer Gravel Equipment Mfg. Co.
Smith Engr. Works

Scrapers (Power Drag)
Iowa Mfg. Co.
*Link-Belt Co.
*Pioneer Gravel Equipment Mfg. Co.
*Sauerman Bros., Inc.

Screens
*Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
Audubon Wire Cloth Corp.
Chicago Perforating Co.
Cleveland Wire Cloth & Mfg. Co.
Continental Screen Co.
Cross Engr. Co.
*Deister Concentrator Co.
*Deister Machine Co.
*Eagle Iron Works
*Gruendler Crusher & Pulverizer Co.
Haiss Mfg. Co., Geo.
*Hardinge Co.
*Hendrick Mfg. Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
*Link-Belt Co.
Manganese Steel Forge Co.
McLanahan and Stone Corp.
Morrow Mfg. Co.
Nordberg Mfg. Co.
*Pioneer Gravel Equipment Mfg. Co.
*Productive Equip. Corp.
*Robins Conveying Belt Co.
*Roebling's Sons Co., John A.
Smith Engr. Works
Smith Wire & Iron Works, F. P.
Sprout, Waldron & Co.
Sturtevant Mill Co.

Screens (Vibrating or Shaking)
*Allis-Chalmers Mfg. Co.
Continental Screen Co.
*Deister Concentrator Co.
*Deister Machine Co.
*Gruendler Crusher & Pulverizer Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Foundry & Machinery Co.
*Link-Belt Co.
McLanahan and Stone Corp.
New Holland Machine Co.
Nordberg Mfg. Co.
*Pioneer Gravel Equipment Mfg. Co.
*Productive Equip. Corp.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.
Sturtevant Mill Co.

Separators (Air) (See Air Separators)

Sheaves
*Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
*Eagle Iron Works
*Gruendler Crusher & Pulverizer Co.
Haiss Mfg. Co., Geo.
Hetherington & Berner, Inc.
*Link-Belt Co.
*Jeffrey Mfg. Co.
McLanahan and Stone Corp.
Pettibone Mulliken Co.
Sprout, Waldron & Co.

Shovels (Electric, Internal Combustion and Steam)
*Harnischfeger Corp.
Koehring Co.
*Lima Locomotive Works, Inc.
*Link-Belt Co.

Skip Hoists and Skips
*Allis-Chalmers Mfg. Co.
Hetherington & Berner, Inc.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Robins Conveying Belt Co.

Speed Reduction Units
Iowa Mfg. Co.
*Link-Belt Co.

Spouts (See Chutes and Chute Liners)

Sprays
*Deister Concentrator Co.

Sprockets and Chain
American Manganese Steel Co.
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Pettibone Mulliken Co.
Sprout, Waldron & Co.

Stackers
*Jeffrey Mfg. Co.

Stairs (Iron)
Smith Wire & Iron Works, F. P.

Stairs (Mine)
Smith Wire & Iron Works, F. P.

Steel (Alloy)
(See Alloys—Steel)

Steel (Abrasion Resisting)
Ryerson & Son, Joseph T.

Steel (Bars, Shapes, Plates, etc.)
Ryerson & Son, Joseph T.

Steel Grating (See Grating, Steel)

Steel Inclines (See Inclines, Steel)

Steel Plate Construction
*Hendrick Mfg. Co.
Hetherington & Berner, Inc.
Manganese Steel Forge Co.
Sprout, Waldron & Co.

Storage Equipment
Haiss Mfg. Co., Geo.
*Jeffrey Mfg. Co.
*Link-Belt Co.
*Sauerman Bros., Inc.

Sweatbands
Goggle Parts Co.

Sweeping Systems
*Allen-Sherman-Hoff Co.

Tanks
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*Link-Belt Co.

Tanks (Sand-Settling)
Iowa Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Morrow Mfg. Co
*Pioneer Gravel Equipment Mfg. Co.
Smith Engr. Works

Testing Sieves and Shakers
*Hendrick Mfg. Co.

Thickeners (Slurry)
*Hardinge Co.

Tire Repair Materials
Goodyear Tire & Rubber Co.

Tires (Truck, Passenger Cars, Tractor)
Goodyear Tire & Rubber Co.

Tools (Drill) (See Drilling Accessories)

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Track Shifters
Nordberg Mfg. Co.

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*Allis-Chalmers Mfg. Co.

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*American Steel & Wire Co.
*Roebling's Sons Co., John A.

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*Allis-Chalmers Mfg. Co.

Transmission Belting (See Belting)

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American Manganese Steel Co.
*Gruendler Crusher & Pulverizer Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.

Trippers
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*Link-Belt Co.
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Truck Cranes (See Cranes)

Truck Mixers
Jaeger Machine Co.

Trucks and Trailers (See Motor Trucks)

Tube-Mills (See Mills—Ball, Tube, etc.)

Tubes (For Tire Casing)
Goodyear Tire & Rubber Co.

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Unloaders (Box Car)
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*Link-Belt Co.

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Taylor Forge & Pipe Works

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*Link-Belt Co.

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Chicago Perforating Co.
Cross Engr. Co.
*Hendrick Mfg. Co.
*Jeffrey Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.
Morrow Mfg. Co.

Vibrating Screens (See Screens—Vibrating)

Wagons (Dump)
Koehring Co.

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*Eagle Iron Works
Haiss Mfg. Co., Geo.
*Hardinge Co.
Iowa Mfg. Co.
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*Link-Belt Co.
McLanahan and Stone Corp.
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*American Steel & Wire Co.
Manganese Steel Forge Co.
McLean Welded Products Corp.
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Well Drills (See Drills—Well)

Wheels (Car)
American Manganese Steel Co.
*Eagle Iron Works
Iowa Mfg. Co.
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Wheel Rims. See Rims—Wheel

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Cleveland Wire Cloth & Mfg. Co.
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Worm Gears (See Gears and Pinions)

*** See also information in the 1935 Pit and Quarry HANDBOOK.**

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DEPENDS ON THE MATERIAL THAT PASSES THRU YOUR SCREEN ! ! !

— NOT THE MATERIAL THAT PASSES OVER YOUR SCREEN —

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CLOSER TOLERANCES

SINGLE OVERHEAD ECCENTRIC

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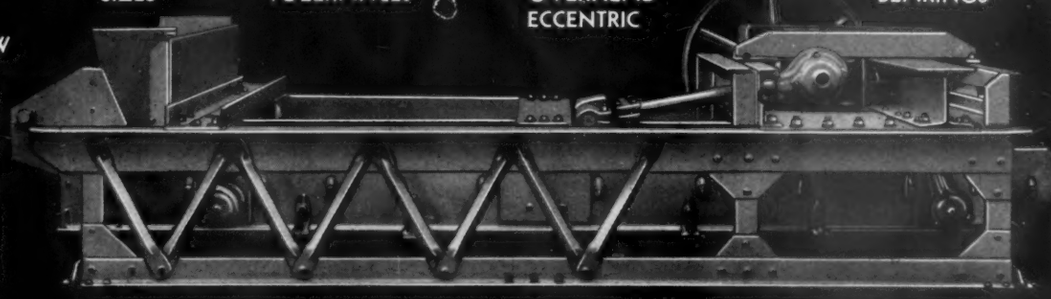

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And the result as one satisfied customer expressed it:

"That wonder and ever present uneasy feeling, as to whether the stone will meet specifications, has changed to pleasant confidence in the use of this screen."

Let us show you what this screen can do for you, on your job.

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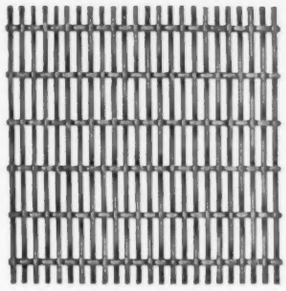

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A super wearing Steel developed to resist the abrasion and vibration of modern screening demands.

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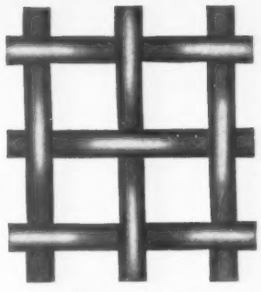
A wire cloth of guaranteed accuracy backed by fine workmanship and an effort to satisfy.

Available in Square Mesh and Rolled Slot. A trial will convince you of the superiority.



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Unique principle of hydrosealing both sides of the impeller against abrasive wear, cuts maintenance to a fraction and saves ⅓ in power costs in pumping sand, gravel, rock and other abrasive materials—Estimated economies guaranteed. Sizes 2" to 22", pulley or motor drive. Descriptive Catalog sent on request.

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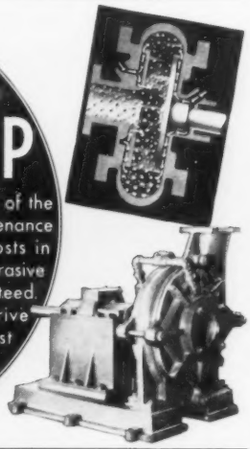

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You buy it for less and you pay less per day to operate it.

Scraper bucket sizes range from ⅓ cu. yd. to 15 cu. yds.
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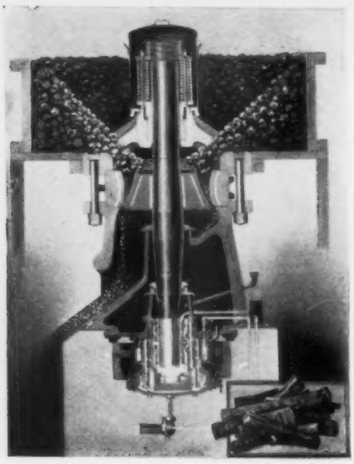

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with

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In Power.....The entire cost of crusher and motor in pulley is amortized annually.

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Minus 3—Plus 4	17%
Minus 4—Plus 14	36½%
Minus 14—Plus 48	15%
Minus 48—Plus 100	4%
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Built in open or enclosed types, in widths ranging from 3′ to 6′ with one or more decks. It can be suspended, or supported from the bottom.

Suitable for scalping oversize from primary crushers, as well as smaller sizes, and chemical products.

The entire screening surface is effective, thereby insuring greatest capacity.

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Screen drive shaft is positioned near the feed end for balancing purposes and is patented.

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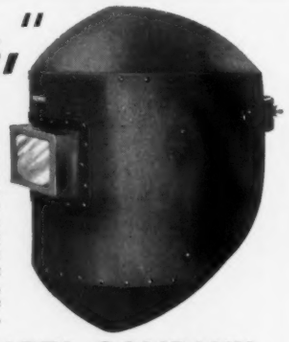
BUCKET ELEVATORS
REVOLVING SCREENS
CRUSHERS DRY PANS

Lewistown Foundry & Machine Co.
Lewistown, Pa.

It's the "tops," says welders



Welding operators don't have to be "sold" on this new helmet. It's their kind of helmet. Built to win their O.K. on every count. It's feather-weight—so light they hardly know it's on their head. Sturdily built, though, to take abuse. And just as compact as can be—gives protection to entire head yet doesn't feel big and bulky. The price, too, will pleasantly surprise you. Write for illustrated bulletin and prices.

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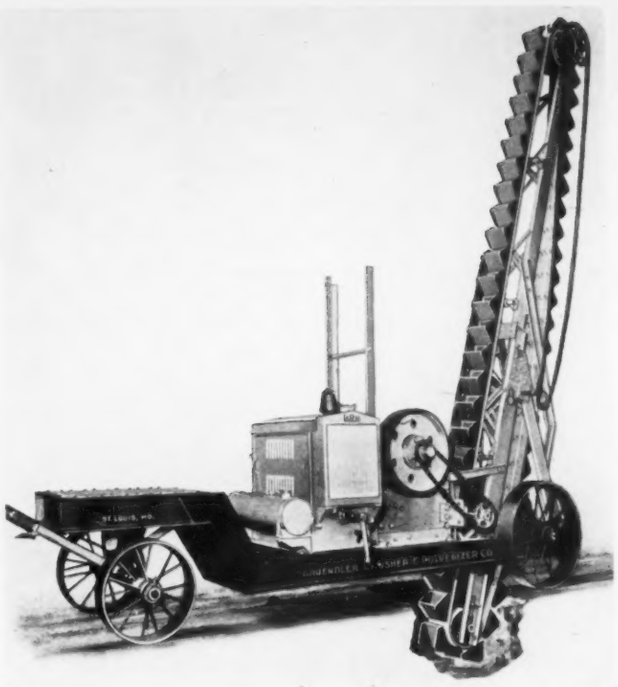

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It embodies a new reduction roll crusher, operating at higher than the usual speed, that produces either small stuff from 1½" down to dust, or larger sizes. With its high capacity and low power consumption, it gives greater output than any machine of its size, and lower upkeep.

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Because they offer every facility for the faster delivery of better concrete ("Dual-Mix" action, 1-man chute, dual controls, rapid accurate water tank and patented discharge) Jaeger Truck Mixers get most of the jobs, serve them at lowest cost, and continue to outsell all other makes. Sizes 1 to 5 cubic yards.

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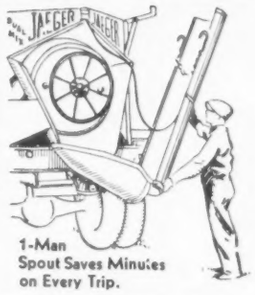

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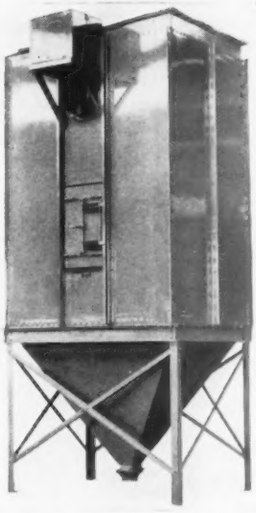
This DRACCO MULTI-BAG FILTER will SAVE you MONEY



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The DRACCO MULTI-BAG FILTER is a low cost, efficient unit that was especially designed to meet your needs and IT WILL SAVE YOU MONEY. It was developed by an organization with 20 years Dust Control experience and has features of construction that contribute to HIGH DUST COLLECTING EFFICIENCY. Any way you look at it DUST is an EXPENSE and the sooner eliminated the better.

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In most plants it is CHEAPER to Control Dust. The results of DRACCO Dust Control will be reflected in your profits because of, (1) increased efficiency of operation; (2) longer life and less maintenance of equipment; (3) improved health of workers; (4) fewer lawsuits. It is better business to Control Dust than to battle it. Write and obtain the benefits of our 20 years' experience.

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Successors to The Dust Recovering & Conveying Co.

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RYERSON STEEL

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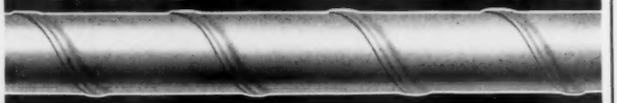

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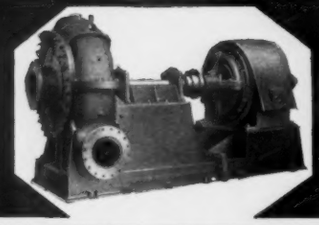

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A BETTER SCREEN FOR ALL SCREENING JOBS
MADE IN A COMPLETE RANGE OF SIZES

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CEDAR RAPIDS, IOWA

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PERFORATED SCREENS.
ROUND
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For all types of Aggregates Screens

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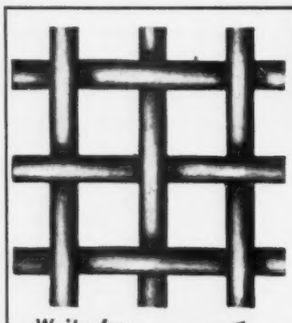

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Established 1884

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WIRE AND IRON WORKS
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CHICAGO

IMPROVED SCREENS—WILL PAY DIVIDENDS

Double your production at half the cost with this new type shaker screen

A. Low first cost.
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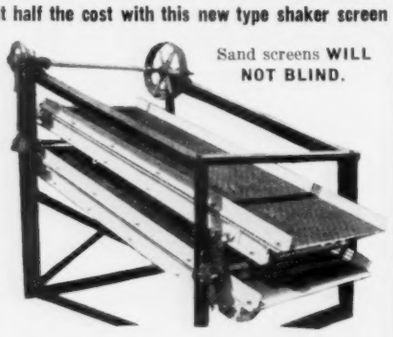
Screen operates in its own frame. Comes ready to bolt to floor.
2 H.P. runs (4 deck 3x7) 100 yd. P.H.



Sand screens WILL NOT BLIND.

CONTINENTAL SCREEN CO., KOKOMO, IND.

On 5th Avenue....

Near Smithfield—one of the most conveniently situated hotels in town—with easy access to all the main points of interest

RATES: Single $1.50 and up; Double $3.00 and up

EXCELLENT RESTAURANT

Breakfast, 40c to 75c Luncheon, 85c
Table d'Hote Dinner, $1.00 and $1.25

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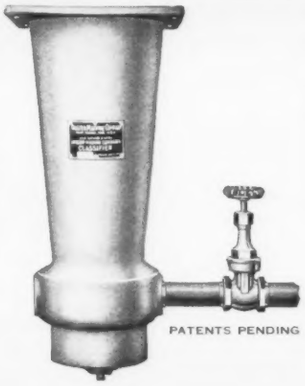
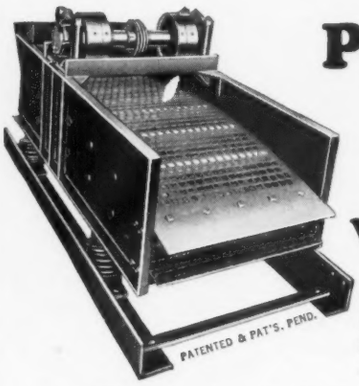
HOTEL HENRY
PITTSBURGH

COMPOUND FUNNEL CLASSIFIER

For sizing minus 5/16" gravel and sand, and for cleaning it by washing out silt and other light impurities.

Descriptive Bulletin No. 23





PLAT-O

Improved Heavy Duty

VIBRATING SCREEN

Built in all standard sizes and in from one to three decks.

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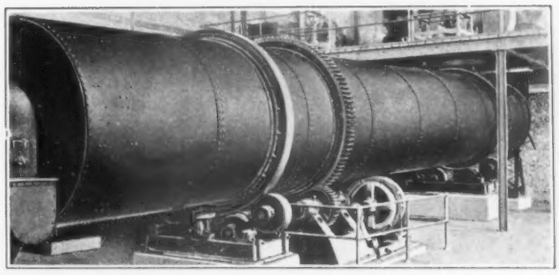
DEISTER MACHINE COMPANY

1933 EAST WAYNE STREET FT. WAYNE, IND.

Ruggles-Coles Dryers



Typical Class XA Ruggles-Coles Dryer Installation for Coal

A Dryer Is Only As Good As the Experience Behind It

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HARDINGE COMPANY

YORK, PA.—Main Office & Works CHICAGO—205 W. Wacker Dr.
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SPEED—POWER for Bigger Payloads!

The Williams "Champion" Bucket is FASTER because of shorter cable overhaul between bucket-fulls—and SUPER POWERFUL due to exclusive power-arm combination of lever and block-and-tackle. We also build Williams Multiple-Rope Clamshell and Dragline Buckets. Write for bulletins.

THE WELLMAN ENGINEERING CO.

7014 Central Ave., Cleveland, Ohio

WILLIAMS • BUCKETS •

QUINN PIPE FORMS

HAND or WET PROCESS

Make concrete pipe on the job with Quinn Concrete Pipe Forms. Get complete information on prices and special construction features of Quinn Forms. Give us size of job for estimate on your pipe form needs.

HEAVY DUTY

Built for more years of service—sizes for any diameter pipe from 12 to 84 inches—any length—tongue and groove or bell end.

MEDIUM DUTY

Makes same sizes pipe as "Heavy Duty" but built to meet demand for lower cost equipment to produce uniform quality in smaller amounts.

Also manufacturers of concrete pipe machines for making pipe by machine process.

QUINN WIRE & IRON WORKS 1627 12 St. Boone, Iowa

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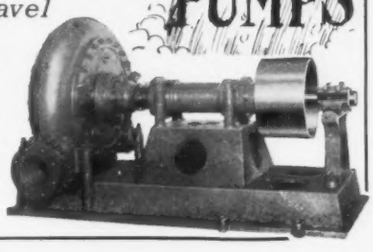
Heavy-Duty (Ball-Bearing) Sand and Gravel

PUMPS

High efficiency — low operating cost—precision workmanship — wear-resisting, non-heating bearings even when operated under extremely high heads. WRITE

KANSAS CITY HAY PRESS CO.

KANSAS CITY, . . . MO.



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are popular in the quarry fields. They wear well. Full range of sizes

Heat-Treated Double-Corrugated Plates

with square, round and "Sqround" perforations. Write for data, particularly on the new "Sqround" Mesh.

Investigate the Weston Testing Screen for making sizing tests.

HENDRICK MANUFACTURING CO. Carbondale, Pa.

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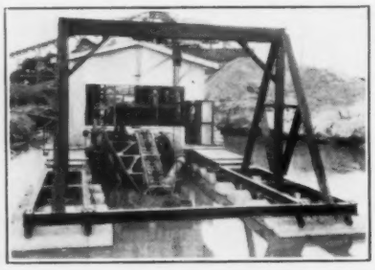
EAGLE SWINTEK SCREEN NOZZLE LADDER LOWER YOUR COST



Will eliminate stoppages and slug pumping—insuring an even, constant feed of solids to the suction nozzle—with less power—greatly decreasing the cost per yard of material produced.

Write for descriptive literature and let us tell you how this can be done with your dredge.

Eagle Iron Works
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CRUSHERS—Double roll and Sledge Wedge Crushers, for practically any product. Capacities to 1000 tons an hour.

SUPER DRY PANS—For especially large tonnages.

WASHERS AND SCRUBBERS—Steel log Washers; scrubbers, cylinder washers, sand drags and washing screens.

DRYERS—Revolving cylindrical, of various sizes.

JIGS—For concentrating and beneficiating hematite and manganese ores.

SCREENS—Cylindrical and conical screens of any size and capacity.

HOISTS, ELEVATORS AND CONVEYORS—Electric, friction and gravity hoists, steel conveyors of different sizes and capacities.

McLanahan & Stone Corp.
Hollidaysburg, Pa.

SYMONS
VIBRATING SCREENS
and
CONE CRUSHERS

Especially adapted for producing better crushed and graded materials in greater capacity at less cost.

NORDBERG MFG. CO.
MILWAUKEE, WIS.

Perforated Metals—Screens of All Kinds—For Sand, Gravel, Stone, Etc.

MATERIAL IN STOCK
PROMPT SHIPMENT

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- ☐ Agitators, sand and Gravel
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- ☐ Air compressors
- ☐ Bag filling and weighing machinery
- ☐ Bags, cloth
- ☐ Bags, paper
- ☐ Balls, steel
- ☐ Barges, steel
- ☐ Belt Dressing
- ☐ Belt fasteners
- ☐ Belting, conveyor and elevator
- ☐ Belting, transmission
- ☐ Belt lacing
- ☐ Belt plates
- ☐ Belt rivets
- ☐ Belt tighteners
- ☐ Bin gates
- ☐ Bins, concrete
- ☐ Bins, steel
- ☐ Blasting supplies
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- ☐ Blocks, friction
- ☐ Boots, self-unloading
- ☐ Bodies, Motor Trucks
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- ☐ Buckets, Conveyor and Elevator
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- ☐ Buckets, Orange Peel
- ☐ Cableways, Slackline
- ☐ Calcining Machinery
- ☐ Car Dumpers
- ☐ Car Pullers and Movers
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- ☐ Cars, Kiln
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- ☐ Chains, Conveyor and Elevator
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AIR COMPRESSORS
Portable and stationary, belt, with elec. or gas. power, sizes from 21 cu.ft. to 1000 cu.ft.

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246—Buckets, all sizes and makes.

CARS
Large lot including std. ga. 6 and 12-yd. and 20-yd., 36-ga. 5-yd. and 24-ga. 1½-yd. Also std. ga. flat cars and ballast cars.
48—Koppel Quarry cars 42" ga. 2½-yd. One way side dump.

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9—Port Belt Conveyors with steel frame, gas. or elec. pr. 18 and 24 in. Barber-Greene and Chic. Automatic.
1—Stationary: Barber-Greene 18"x 100'.
11—Bucket elevators; 6 Chain Belt Co. and Weller and Link Belt vertical enclosed type; capacities from 35 to 117 tons per hour. 5—Weller inclined type Nos. 3, 4, 5 and 6 up to 170 yds. per hr.

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5—Locomotive cranes; sta. ga. 30 and 25-tons; Ohio, Browning, American, Industrial.
1—American 15-ton gasoline powered locomotive crane on 8 wh. MCB trucks, 50 ft. boom. Model 158-G.

HOISTS
Gasoline, electric and steam. All sizes.

CRANES AND DRAGLINES
1—Northwest Model 104, No. 1427, 45-ft. boom, 1½-yd. bucket.
2—Osgood Nos. 2054, 2069, with 40-ft. boom, 1 with 1-yd. shovel front.
1—Brownhoist No. 2, No. 9964, 40-ft. boom, 1-yd. bucket.
1—Link Belt K-1, No. 1024, 50-ft. boom, 1-yd. bucket.
1—Industrial Brownhoist, type CC, No. 5071, 36-ft. boom, ½-yd. bucket.

CRUSHERS AND SCREENS

1—Symons coarse cone crusher, size No. 5½, SU No. 521; capacity 450 tons per hour of 2½" material—130 tons per hour of ½" material; weight, 85,000 lbs.
1—Set Power and Mining Machinery Co. crushing rolls, size 42 in. x 16 in., rated capacity 15-20 tons per hour of ⅝" material; weight 41,000 lbs.
1—No. 6 Champion jaw crusher, No. U-1075-4; jaw opening 12"x26"; capacity 24-35 tons per hour of 2" material; weight 20,000 lbs. Like new.
2—No. 3 McCulley gyratory crushers; size of each opening 7"x28"; capacity 25 tons per hour of 2¾" material; 11 tons per hour of 1¼" material; weight 17,000 lbs.

SCREENS
2—Allis Chalmers roller type, all steel, heavy duty, 48 in. dia. by 24 ft. long screen in 3 sections.
2—P. & M. Roller type, 48 in. by 18 ft. long.
1—Allis Chalmers, roller type 51" dia. by 21 ft. long.

DERRICKS
Steel and wood, stiff leg, or guy; from 5 to 50 tons, including 3 steel stiff legs; 1—20-ton Terry 100 ft. boom; 1—10-ton Insley 80 ft. boom and 1—10-ton American, 80 ft. boom.

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3—Gardner Denver wagon or derrick drills with Model 21 or 17 Gardner drills for channelling.
25—Ingersoll-Rand and Sullivan jackhammer column and tripod drills.

LOCOMOTIVES
32—Gasoline locomotives from 14-ton to 2-ton, std. 36 and 24-ga.
1—3 ton 42" ga. Fordson.
1—24-ton Porter steam, saddle tank, cyl. 12"x16" st. ga. Serial No. 5093.

PUMPS
All sizes and types, both force, centrifugal and steam.

SHOVELS
1—Osgood comb. heavy duty 1-yd. gas. shovel and crane, No. 2069.
1—Model "60" Thew crawler mounted gas. shovel with ½-yd. dipper.
1—Link Belt type K-25 ¾-yd. gas combination shovel and crane; shop No. 1521; 60-ft. crane boom; 25 ft. shovel boom.
1—Industrial Brownhoist type DC 1⅛-yd. Diesel combination shovel and crane; shop No. 5176.

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Equipment for Sale Cheap

1—Vulcan 40 ton Std. Ga. Saddle tank locomotive.
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1—Marion 1 yd. Steam crane 40' boom, on cats.
1—Marion 15 ton gas crane 40' boom.
1—Link-Belt K-2 crane 50' boom 15 ton capacity.
1—Link-Belt K-44 crane 50' boom.
1—Browning ⅝ yd. shovel 35' crane boom.
1—Lorain 75 A 1¼ yd. chain crowd shovel.
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1—Lambert 3 drum hoist with Swinger Buda gas eng.
1—80 HP. Pennsylvania loco. type boiler.
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1—Monarch 75 Caterpillar with bulldozer.
1—Sullivan 310' portable compressor.
1—Chicago Pneumatic 220' portable compressor.
2—Ingersoll-Rand 220' portable compressors.
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6—2 wheel concrete buckets.
1—Ransome 27 E paver.
1—7 E Koehring paver self propelling.
2—1 yd. Insley bottom dump concrete buckets.
1—1 yd. Steubner bottom dump concrete bucket.
1—1 yd. Blaw-Knox clamshell bucket.
1—1 yd. Kiesler rehandling bucket.
1—¼ yd. Hayward orange peel bucket.
1—¾ yd. Browning clamshell bucket.
1—⅝ yd. Owen digging bucket.
1—¾ yd. Blaw-Knox bucket.
1—Morris 8" dredge pump 150 HP. GE. mtr.
1—Morris 10" cent. pump 2250 GPM @ 130' head.
1—Goulds 12" cent. pump 50 HP. GE. motor.
1—Thompson 6" self priming pump Waukesha mtr.
4—Humdinger 6" self priming pumps gas motor.
2—Domestic 4" self priming pumps.
1—GE motor 200 HP. slipring.
1—7 McKiernan-Terry hammer.
1—5 McKiernan-Terry hammer.

HARRY C. LEWIS, 325 Frelinghuysen Ave., Newark, N. J.

LOCOMOTIVES STANDARD GAUGE

3—72-ton American 6-wheel Switcher with separate tenders.
1—50-ton Davenport 6-wheel Switcher with separate tender.
2—50-ton American 4-wheel saddle tanks.
4—40-ton American 4-wheel saddle tanks.
2—36-ton Porter 4-wheel saddle tanks.
2—33-ton Vulcan 4-wheel saddle tanks.
2—30-ton American 4-wheel saddle tanks.

BIRMINGHAM RAIL & LOCOMOTIVE COMPANY
Birmingham, Alabama

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2 Bucyrus 2 yd. Diesel Draglines.
Link Belt 1½ yd. Shovel and Crane.
Lima 1½ yd. Shovel and Crane.
7½ ton Universal Truck Crane.
1¼ yd. Thew Steam Shovel.
Link-Belt K-35, 1¼ yd. Cat. Crane.
2 Caterpillar 60 Diesel Tractors.
1 Caterpillar 75 Diesel Tractor.
15—3 yd. Koppel V, 36 ga. Dump Cars.
6—14 ton Whitcomb Gas. Locos., 36 ga.
14 ton Whitcomb Std. Ga. Gas Locomotive.
60 HP Portable Firebox Boiler.
750-1250-1800 yd. Asphalt Plants.
Rotex 48x72, No. 18, 2 Deck Screen.
Rotex 36x84, No. 6R, 1 Deck Screen.
Traylor 36x16 Sand Rolls.
Champion 1030 Roller Bearing Jaw Crusher.
Acme 18x11 Model 9½D Jaw Crusher.
Worthington 36x24 Jaw Crusher.
Allis Chalmers 48x36 Jaw Crusher.
3 ft., 5½ ft., 7 ft. Symons Cone Crushers.
18 in. and 24 in. Symons Disc Crushers.
No. 0 Raymond Lime Pulverizer.
6 ft. by 8 ft. Traylor, Tube Mill.
Pennsylvania SX4 and SX6 Pulverizers.
400 KW Busch Sulzer Diesel Generator.
72 KW Worthington Diesel Generator.
Portable Air Compressors: 110-220 & 320' cap.
Orange Peel Buckets: 5 ft. to 48 ft. cap.
1730 ft. Chicago Pneumatic Elec. Air Comp.
Complete Plants Bought and Sold.

R. C. STANHOPE, INC.
875 Sixth Ave. New York, N. Y.

FOR SALE

Gyratory Crushers: No. 6, No. 5 and 10" Superior McCully, No. 5 Austin, No. 4 Style N, No. 3 and No. 2 Gates.
Symons Horizontal Disc Crushers: 48" and 24".
Jaw Crusher: 6x14, 8x16, 10x20, 16x24, 8x36, 11x36, 24x36.
Gas and Electric Motors: 1 HP to 200 HP.
Hoists: Clyde 2 drum for 2 yd. drag scraper, Thomas 2 drum for 1½ yd. drag scraper, several smaller.
Insley 5 ton all steel derrick, 80' boom, 90' mast, 2—55' guy struts, 16' bull wheel. 7x10 three drum hoist engine. 3x4 swing engine.
4 Complete gravel washing plants.

LIPPMANN ENGINEERING WORKS
4603 W. Mitchell St. Milwaukee, Wis.

3—Hardinge Mills, 4½'x16", 5'x22", 8'x30".
3—Jaw Crushers 10"x7", 24"x12", 30"x 60".
2—Sturtevant No. 1, No. 1½ Rotary Fine Crushers.
4—Gates Gyratory Crushers No. 3D, No. 6D.
5—Traylor Crushing Rolls, 42"x18", 36"x 16".
3—Raymond Mills, two roll, four roll.
6—No. 0000, 500, 51 Raymond Mills.
2—Rod Mills 5x10', 4x10'.
2—12" Traylor Bulldog Gyratory Crushers.
1—Symons 7' Cone Crusher.
4—Tyler, Sturtevant Vibrating Screens, single and double units.
6—Hammer Mills, Jeffrey, Williams.

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STEIN-BRILL CORPORATION
183 Varick Street, New York City, N. Y.

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- Sell
- Buy
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- and Sizes

GREGORY HI-GRADE-REBUILT

Electric Motors, Pumps, Air Compressors Big Bargains. All Standard Makes.

Always Dependable Economical

Money-Back Guarantee

GREGORY ELEC. CO.
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Jaw Crushers—2"x4" up to 66"x84".
Crushing Rolls—12"x12" up to 54"x64"—Gyratory Crushers.
Ring Roll Mills—No. 0 and No. 1—Swing Hammer Mills.
Rotary Fine Crushers—No. 1, No. 1½, No. 2.
Direct Heat Rotary Dryers—4'x30', 5'x30', 5½'x40' and 6'x50'.
Semi-indirect heat Dryers—4'x30', 4½'x26', 5'x30' and 8½'x75'.
Cement Kilns—3' up to 8' diameter.
Hardinge—Marcy & Fuller-Lehigh Mills.
Raymond Mills—No. 00, No. 0 and No. 1.
Tube—Rod and Ball Mills—4' to 8' diameter.
Air Separators—3' and 10' Gayco—Screens.
Complete drying and asphalt mixing plants.

W. P. HEINEKEN
95 Liberty St., N. Y. Tel.: Barclay 7-7298

FOR SALE

2—3½ ton 36" ga. Plymouth Gas Locomotives.
12—5 yd. 36" ga. Western Dump Cars.
6—2 yd. 36" ga. Koppel Steel V-shape Cars.
4—1½ yd. 36" ga. Insley V-shape Dump Cars.
23—12 yd. Western 2-way Air or Hand Dump Cars.
4—50 ton 41 ft. Steel Flat Cars.
26—50 ton Center Dump Gondola Cars.
2—40 ton Baldwin S.T. Locomotives, 14x22 cyls.
Rails—First-Class Relaying Rails, 60, 70, 80, 85, 90 and 100 Lb. Rails and Bars, Tie Plates, Spikes, Switches.

HYMAN-MICHAELS CO.
20 N. Wacker Dr. Bldg. Railway Exchange Bldg.
CHICAGO, ILL. ST. LOUIS, MO.

MOTORS—
3 PH., 60 CY.

Hp.	Type	Speed
2850	G. E. Syn.	450
675	Al. Ch. Syn.	900
600	G. E. Syn.	257
600	G. E. sl. rg.	257
600	G. E. sl. rg.	720
400	West. sl. rg.	514
300	G. E. sl. rg.	585
260	Al. Ch. Syn.	720
250	F. M. sl. rg.	1200
200	West. sl. rg.	900
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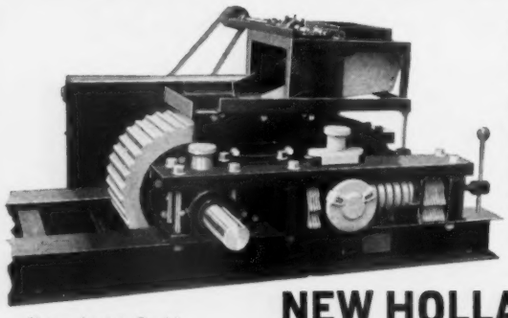

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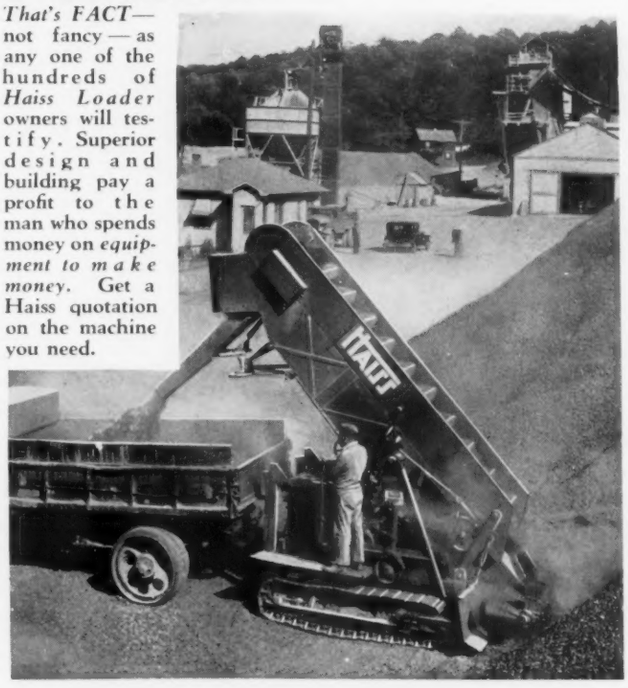

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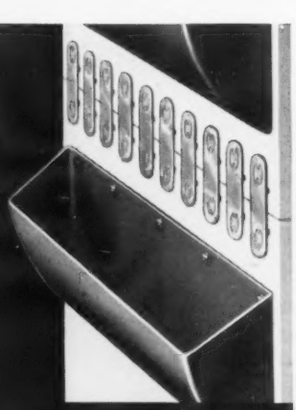

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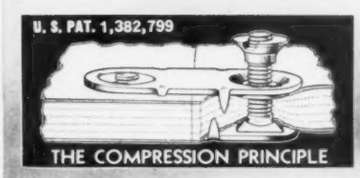

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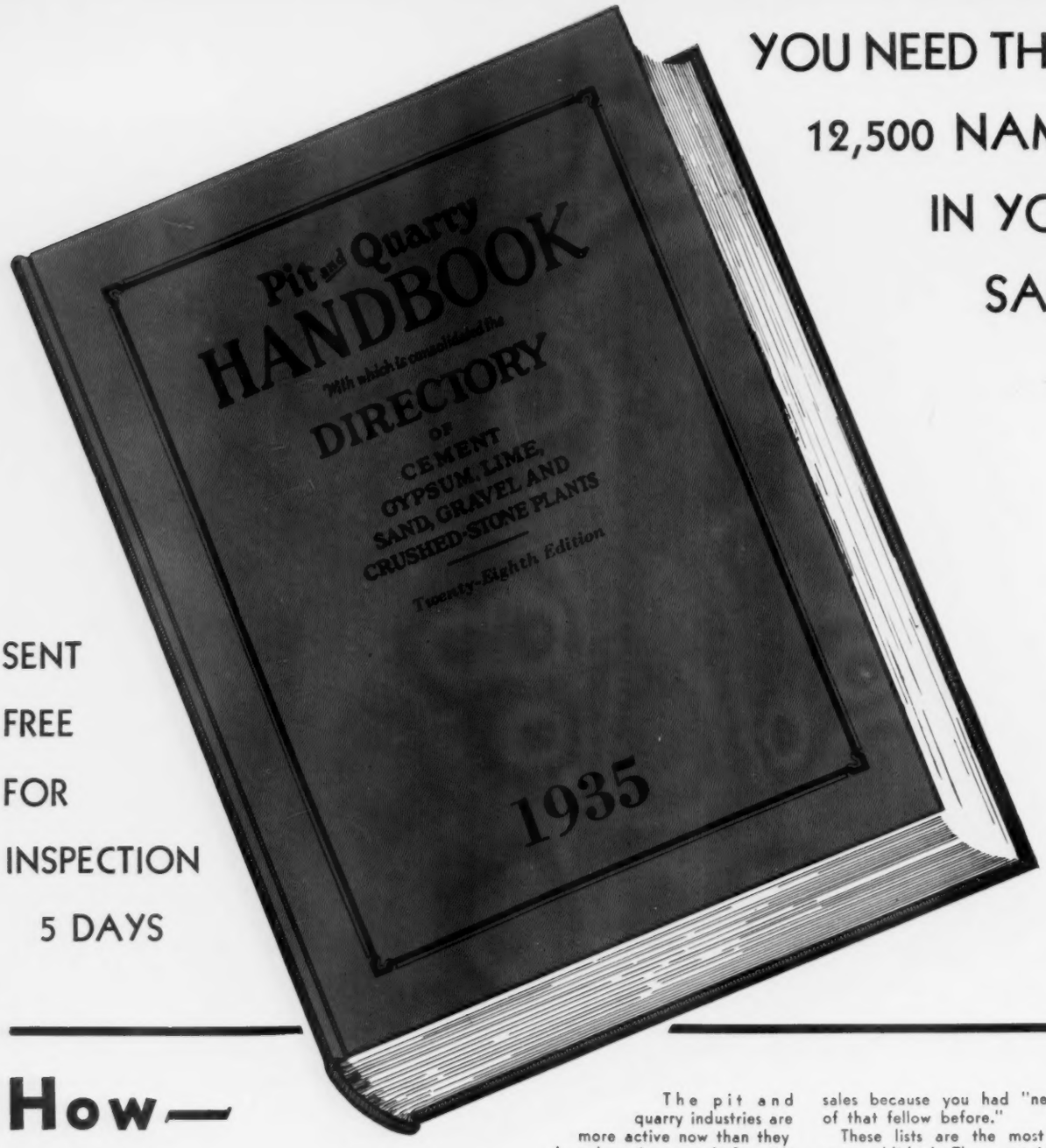

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